A SURVEY OF HIGH RISK PREGNANT MOTHERS IN THE DISTRICT OF PASIR PUTEH, KELANTAN

DR. CHE ABDULLAH BIN HAJI HASSAN

PER. UNIV. MALAYA
A502458255

A DISSERTATION SUBMITTED TO
THE UNIVERSITY OF MALAYA
FOR PARTIAL FULFILMENT OF
THE DEGREE OF
MASTER OF PUBLIC HEALTH

1988/1989

ACKNOWLEDGMENT

I would like to express my deep gratitude to the following persons whose interest and help made the writing of this dissertation possible.

Dr. Yap Sim Bee, my lecturer and supervisor, who was ever approachable, free with her help and advice and patient in her guidance.

Dr. Azmi Shapie, the Medical Officer of Health of the District of Pasir Puteh, who kindly gave permission to carry out the survey in his health district.

Pn. Robeah M.Ripin, the Public Health Sister of Pasir Puteh, who played a very big role in mobilising her nursing staff during the collection of data.

All the many others whose names are not mentioned here who had helped me in whatever way in completing this work.

CONTENT

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

CHAPTER I (INTRODUCTION)

1. MATERNAL AND CHILD HEALTH

1.1 Maternal and Child Health - the World

Maternal and Child Health is one of the most important areas of basic promotive and preventive health.It covers aspects that include protection of the foetus,infant and child;the education of parents and children about personal health,disease prevention and child care;the improvement of nutritional knowledge and nutritional status of mothers and children;the improvement of the environment in which families live;the choice by parents to have the number of children they want and can care for;the prevention of handicapping conditions;and the promotion and provision of care of handicapped children and other children requiring special care,services and protection.In short it has a direct influence in determining the quality of life and the attainment of optimal health in each and succeeding generation.

Mothers and children form the majority of the population of any country.Children under the age of fifteen years represent almost half the poulation in developing countries,whereas females of reproductive age represent one-fifth. Therefore Maternal and Child Health care is important because it concerns a major and also vulnerable portion of the population:the foetus,infant and child who undergo rapid growth and development,and

their mothers may face certain critical periods and high risk situations (Wallace & Ebrahim, 1981).

Over the years most countries of the world have improved their Maternal and Child Health status by paying greater attention to preventive and promotive aspects of health as compared to the earlier over-emphasis on the curative component.However disparity still exists very much not only between developed and developing countries but also among the individual countries,more so the developing ones. The following tables would illustrate this disparity between some selected developed and developing countries.

Table 1. MATERNAL MORTALITY PER 100000 LIVE BIRTHS SELECTED COUNTRIES 1966 AND 1972

COUNTRY	1966(1)	1972(2)	(2) AS % OF(1)
Mauritius	108.1	176.4	163.0
Canada	34.8	15.5	44.0
Chile	239.4	178.5	74.6
Hong Kong	43.3	19.9	46.0
Japan	93.0	40.6	43.7
Thailand	298.2	222.4	74.6
Portugal	83.1	55.0	66.2
Sweden	11.3	7.1	62.8

Source:World Health Statistics Report,vol.22,no.6 (1969)
World Health Statistics Annual,1972 Vol.1. Vital statistics and causes of death. Geneva WHO 1975.

Table 2. INFANT MORTALITY RATES (PER 1000 LIVEBIRTHS) AND BIRTH RATES (PER 1000 POPULATION), SELECTED COUNTRIES, 1977

COUNTRY	I.M.R.	B.R.
WORLD	103	30
AFRICA	154	45
Guinea-Bissau	208	40
Egypt	116	36
Mauritius	46	25
ASIA	116	32
Afghanistan	182	43
Malaysia	75	35
Japan	10	17
AMERICA	47	26
Haiti	150	36
Brazil	82	37
USA	16	15
EUROPE	22	15
Romania	35	22
Czechoslovakia	21	20
Sweden	8	13

Source: World Population Estimates,1977.
The Environmental Fund, Washington,D.C. 1977.

Table 3. PERINATAL MORTALITY RATES(PER 1000 LIVE BIRTHS) SELECTED COUNTRIES, 1972.

COUNTRY	PERINATAL MORTALITY RATES		TOTAL
	Late Foetal Deaths	Deaths Under 7 Days	
MAURITIUS	35.2	25.0	60.2
CANADA	8.8	10.4	19.2
JAPAN	12.8	6.1	19.0
PEN.MALAYSIA	21.1	16.1	37.2
SWEDEN	6.8	7.6	14.4
ITALY	14.0	15.6	29.6
FIJI	43.3	4.4	47.7

Source: Wallace,H.M., Medina,A.S., Minkler,D.H.,(1981)

1.2 Maternal and Child Health - Malaysia.

Malaysia has taken the right step in emphasising the preventive and promotive aspects of health care.The majority of the Malaysian population did and still live in the rural areas.So it was relevant and timely that Malaysia implemented the Rural Health Service since the 1960's which entailed the setting up of rural health units whose functions are to serve designated populations and improve the health status of the rural community.Areas given priority included maternal and Child Health.Following that satisfactory progress has been recorded in reduction of mortality rates and the

increased utilisation of modern health care and facilities.Needless to say, Malaysia has still a long way to go to be on par with the developed nations.

Disparity in health status still exists between the States of the Federation of Malaysia.The backward States are like those in the north and north-east of Peninsular Malaysia (Kedah,Perlis,Perak,Kelantan,Terengganu and Pahang) where the populations are mainly rural and socioeconomically they are still lagging behind the other states in the Peninsula.

The High Risk Approach.

Partly due to resource limitations and mainly to improve programme effectiveness the High Risk Approach in Maternal and Child Health was adopted as a strategy by Malaysia in 1981 and finalised for implementation in 1984. It is a "tool for the organisatio of health sevices....Its aim is to give special attention to those in greatest need within a framework of improved health care for all" (WHO, 1978).

High risk factors were defined according to severity,preventability and frequency. Target groups with higher risk levels were identified and given greater attention (Malaysia, 1983).

The following tables would indicate the maternal and child health status in Malaysia as well as the disparity between the various States (Tables 4 to 7).

Table 4. SELECTED MORTALITY RATES (PER 1000 LIVEBIRTHS) PENINSULAR MALAYSIA 1970-1983

MORTALITY	1970	1975	1980	1981	1982	1983
Perinatal	-	-	26.71	23.75	23.28	22.94
Infant	40.80	33.20	23.99	19.71	19.26	20.33
Maternal	1.48	0.83	0.63	0.59	0.50	0.40

Source: Annual Report 1983/84 Min.of Health Malaysia.

Table 5. MATERNAL MORTALITY RATES (PER 1000 LIVEBIRTHS) BY STATE, MALAYSIA 1987.

NO.	STATE	RATE
	(PENINSULAR MALAYSIA)	0.28
1.	Perlis	0.58
2.	Kedah	0.24
3.	Pulau Pinang	0.13
4.	Perak	0.49
5.	Selangor	0.19
6.	Wilayah Persekutuan	0.10
7.	N.Sembilan	0.16
8.	Melaka	0.13
9.	Johor	0.30
10.	Pahang	0.42
11.	Terengganu	0.27
12.	Kelantan	0.32
13.	Sabah	0.14
14.	Sarawak	-

Source: Statistics Department, Malaysia.

Table 6. INFANT MORTALITY RATE (PER 1000 LIVEBIRTHS) BY STATE, MALAYSIA 1987

NO.	STATE	RATE
	(PENINSULAR MALAYSIA)	14.36
1.	Perlis	15.94
2.	Kedah	18.34
3.	Pulau Pinang	12.87
4.	Perak	16.31
5.	Selangor	11.16
6.	Wilayah Persekutuan	-
7.	Negeri Sembilan	9.91
8.	Melaka	10.96
9.	Johor	14.02
10.	Terengganu	16.39
11.	Kelantan	17.80
12.	Sabah	20.80
13.	Sarawak	9.10

Source: Statistics Department, Malaysia.

Table 7. HOME AND INSTITUTIONAL DELIVERIES PENINSULAR MALAYSIA 1984

	No.		%
TOTAL DELIVERIES	323,261		100.0
INSTITUTIONAL DELIVERIES:			
Govt.Hospitals	146,262	}	
Private Hospitals/ Maternity Homes	26,528	}	54.0
Estate Hospitals	563	}	
HOME DELIVERIES:			
Govt. Midwives	104,498	(70%)}	
Private Midwives	1,085	}	
TBA	23,325	(16%)}	46.0
BBA	18,910	}	
Others(No available data)	2,090	}	

Source: Annual Report 1983/84 Ministry of Health Malaysia.

Table 8. MAJOR CAUSES OF MATERNAL DEATHS
MALAYSIA 1984

CAUSES	NO.
PPH and Retained Placenta	46
PET and Eclampsia	39
PPH	38
Embolism (Pulmonary, Amniotic, Cerebral)	22
Other Causes	20
Diagnosis Not Known	14
Causes related to Other Diseases	13
Causes related to Heart Condition	11
APH	6
Post-partum Infection	6
Abortion	3
TOTAL	218

Source: Annual Report 1983/84 Ministry of Health Malaysia.

As can be seen in Table 8 above PPH, post-partum infection and PET and eclampsia are preventable and they make up the majority of the maternal mortality causes. Hence, according to the High Risk Approach, they should be tackled first and foremost in order to improve Maternal and Child Health status effectively and rapidly.

2. THE DISTRICT OF PASIR PUTEH (BACKGROUND OF STUDY AREA)

Kelantan is the northern-most State on the East Coast of Peninsular Malaysia.It is also one of the less developed with the majority of its population being rural Malays working in agriculture.

Pasir Puteh is one of the eight districts in the State of Kelantan.It has an area of 433.8 sq.km. Topographically it is divided into low-lying and hilly areas.It is traversed by a river,Sungai Semerak.

Administratively Pasir Puteh is under a District Officer.The eight subdistricts (Figure 1) are each under a subordinate officer called Penggawa.The subdistricts are subdivided into 63 mukims which are further subdivided into 272 kampungs.

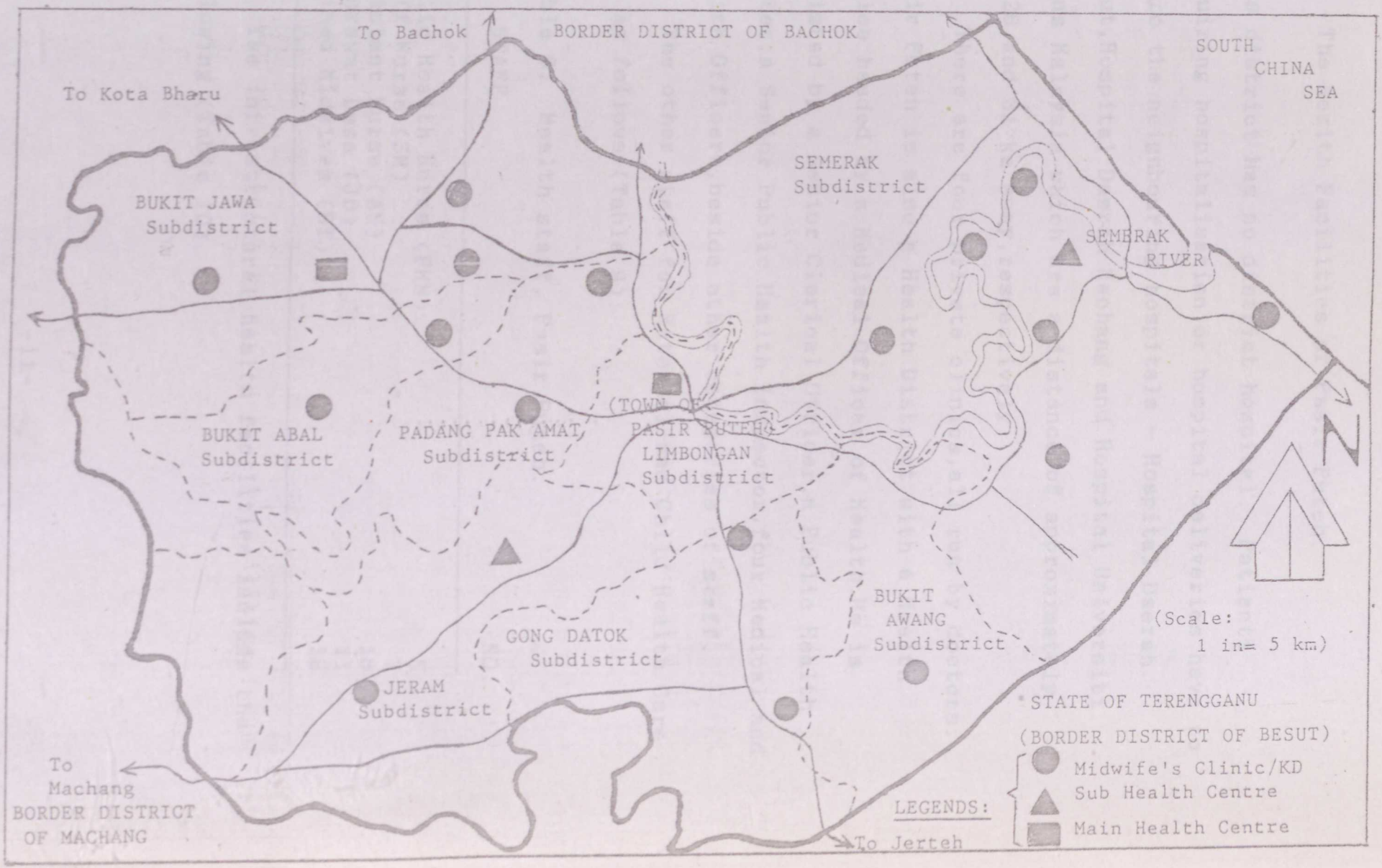
The population of Pasir Puteh was 84,321 making up 9.4% of the population of Kelantan.40,886 males and 43,435 were females (Population Census, 1980).

The economic activities are as follows:

ACTIVITY		% OF POPULATION
AGRICULTURE		85%
Padi	(21,535.0 ha)	
Rubber	(7,805.0 ha)	
Tobacco	(2,285.7 ha)	
OTHERS		15%
Trading		
Government employees		
Other occupations		
TOTAL	(31,625.7 ha)	100%

Source: Report of Pasir Puteh District Office 1988.

Figure 1. THE MAP OF THE DISTRICT OF PASIR PUTEH IN THE STATE OF KELANTAN, MALAYSIA.



The Health Facilities of Pasir Puteh.

This district has no district hospital. Patients requiring hospitalisation or hospital deliveries have to go to the neighbouring hospitals - Hospital Daerah Besut,Hospital Daerah Machang and Hospital Universiti Sains Malaysia which are a distance of approximately 20,26 and 31 km away,respectively.

There are four private clinics,all run by doctors. Pasir Puteh is also a Health District with a Health Office headed by a Medical Officer of Health.He is assisted by a Senior Clerical Officer,a Public Health Sister,a Senior Public Health Inspector,four Medical and Health Officers,beside other categories of staff.

The other staff for Maternal and Child Health Care are as follows (Table 9):

Table 9. Health staff, Pasir Puteh.

STAFF	NO.
Public Health Nurse (PHN)	5
Staff Nurse (SN)	7
Assistant Nurse (AN)	16
Jururawat Desa (JD)	11
Trained Midwives (BT)	19

The infrastructural health facilities include the following (Table 10).

Table 10. Health facilities, Pasir Puteh.

FACILITIES	NO.
Main Health Centre (PKB)	2
Sub Health Centre (PKK)	2
Klinik Desa (KD)	10
Midwife's Clinic-cum-Quarters (RBK)	7

The Maternal and Child Health status of Pasir Puteh are indicated by the following tables:

Table 11. COVERAGE OF PREGNANT MOTHERS 1987

	KELANTAN	PASIR PUTEH
New Attendance	39,101	3,292
Attendance	249,448	24,690
% coverage	73.99	69.10
Average no.of clinic visits	6.33	7.50

Source: Annual Report 1987, Family Health Unit, Kelantan

$$\% \text{ coverage} = \frac{\text{New Attendance x 100}}{\text{Estimated no.of pregnant mothers}}$$

$$\text{Average no. of clinic visits} = \frac{\text{Attendance}}{\text{New attendance}}$$

Table 12. PLACE AND ATTENDANCE AT BIRTH 1987

	KELANTAN	PASIR PUTEH
Total Births	39,900	3,593
Hospital Deliveries	10,449	677
(%)	(26.19)	(18.84)
Home Deliveries	29,451	2,916
(%)	(73.81)	(81.16)
Home Deliveries By:		
Trained Personnel (%)	22,510 (76.43)	2,303 (78.98)
BBA (%)	5,457 (18.53)	353 (12.11)
TBA (%)	1,484 (5.04)	260 (8.92)
Safe Deliveries (%)	32,959 (82.60)	2,930 (82.94)
Unsafe Deliveries (%)	6,941 (17.40)	613 (17.06)

Source: Annual Report 1987, Family Health Unit,Kelantan

Table 13. PLACE AND ATTENDANCE AT BIRTH FOR HIGH RISK MOTHERS 1987 KELANTAN BY DISTRICT

DISTRICT	HOSPITAL	HOME DELIVERIES BY				SAFE	UNSAFE
		*T.P.	BBA	TBA	TOTAL		
	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Ulu Kel. /K.Krai	546 (27.9)	911 (46.5)	141 (7.2)	361 (18.4)	1413 (72.1)	1457 (74.4)	502 (25.6)
Machang	490 (36.9)	641 (48.2)	183 (13.8)	15 (1.1)	839 (63.1)	1131 (85.1)	198 (14.9)
Tanah Merah	555 (33.3)	822 (49.3)	275 (16.5)	17 (1.0)	1114 (66.8)	1377 (82.5)	292 (17.5)
Pasir Puteh	426 (27.6)	920 (59.7)	103 (6.7)	93 (6.0)	1116 (72.4)	1346 (87.3)	196 (12.7)
Bachok	257 (16.7)	1089 (70.8)	192 (12.5)	0 (0.0)	1281 (83.3)	1346 (87.5)	192 (12.5)
Pasir Mas	753 (35.9)	1012 (48.3)	302 (14.4)	29 (1.4)	1343 (64.1)	1765 (84.2)	331 (15.8)
Tumpat	640 (34.4)	951 (51.1)	196 (10.5)	75 (4.0)	1222 (65.6)	1591 (85.4)	271 (14.6)
Kota Bharu	1018 (28.4)	2160 (60.3)	406 (11.3)	0 (0.0)	2566 (71.6)	3178 (88.7)	406 (11.3)
KELANTAN	4685 (30.1)	8506 (54.6)	1798 (11.5)	590 (3.8)	10894 (69.9)	13191 (84.7)	2388 (15.3)

*T.P. = trained personnel
Source: Annual Report 1987 Family Health Unit,Kelantan.

Table 14. PERCENTAGE OF BIRTH WEIGHTS BELOW 2.5 KG

YEAR	1978	1980	1985	1986	1987
PEN.MALAYSIA	10.5%	9.9%	-	-	-
KELANTAN	11.0%	10.8%	6.3%	5.7%	3.6%
PASIR PUTEH	-	-	7.4%	7.6%	3.4%

Source: i) Statistics Department Malaysia
ii) Nutrition Unit,Health Department Kelantan

Table 15. FAMILY PLANNING
PASIR PUTEH AND KELANTAN 1987

	PASIR PUTEH	KELANTAN
NEW ACCEPTORS	31	596
PROVISIONAL ACCEPTORS	28	303
REVISITS	500	12732
ACTIVE USERS	78	2051
MISSED APPOINTMENTS	28	615
PAP SMEAR:(+VE)	-	2
(-VE)	-	198

Source:Annual Report 1987 Family Health Unit Kelantan

Table 16. VITAL STASTICS OF PASIR PUTEH AND KELANTAN
1986/1987

	PASIR PUTEH		KELANTAN	
	1986	1987	1986	1987
Total Births	3651	3593	40404	39900
Live Births	3636	3573	40070	39630
Stillbirths	37	25	505	429
(Rate)	(10.1)	(7.0)	(12.5)	(10.7)
Perinatal Deaths	52	45	792	737
(Rate)	(14.2)	(12.5)	(19.6)	(18.5)
Neonatal Deaths	23	24	392	402
(Rate)	(6.3)	(6.7)	(9.8)	(10.7)
Postneonatal Deaths	34	24	289	266
(Rate)	(9.3)	(6.7)	(8.6)	(6.7)
Infant Deaths	57	48	734	666
(Rate)	(15.6)	(13.5)	(18.3)	(16.8)
Maternal Deaths	1	5	22	23
(Rate)	(0.20)	(1.40)	(0.54)	(0.58)

Source:Annual Report 1987 Family Health Unit Kelantan

The above tables show that the Maternal and Child Health status of Pasir Puteh are still unsatisfactory with a large room for improvement.Mortality rates are still high and do not show consistency of improvement in all aspects - a case in point is the maternal mortality rate which even though it went down to 0.20 (per 1000 live births) in 1986 came up to 1.40 in 1987.Pregnant mothers in general still do not accept the idea that it is safer to deliver in hospitals.This is,unfortunately, also true for identified high risk mothers.

3. THE HIGH RISK PREGNANCY

3.1. Definitions.

A "risk" is defined by a dictionary as "hazard, danger,exposure to mischance or peril".It implies that the probability of adverse consequences is increased by the presence of some characteristic or factor.

A "risk factor" is defined as "any ascertainable characteristic or circumstance of a person or group of persons that is known to be associated with an abnormal risk of having,developing,or being especially adversely affected by a morbid process".[WHO, 1972)

"High risk pregnancy" is defined as one in which prospective mothers have, or are likely to have, conditions associated with child bearing which include hazards to the health of the mothers or their infants

[including those which may cause physical or mental defects in the infants} (Gold, 1973).

3.2. Relationships between Risk Factors and Outcomes.

Risk factors can be causative i.e.triggering off pathological processes (eg.maternal malnutrition can cause low birth weight).They can be contributory to outcomes (eg.grandmultiparity facilitating transverse lie and prolapse of the cord).The risk factors may also be predictive of the outcomes,or associative in the statistical sense;the characteristics that make up the risk factor are themselves associated with underlying causes which are unidentified or ill-understood (eg.a woman with previous foetal or child loss is at greater risk of losing her next infant).

The importance of the risk factor depends on the degree of association with the outcome, as well as the frequency of the outcome.The severity of the outcome of a risk factor,eg. foetal death,if the factor were uncommon in the community,would have a small impact on total foetal mortality (WHO, 1978).

3.3. Identification and Definition of Risk Factors.

The factors to be considered can be classified as community (population or socioeconomic) factors and individual factors as in the following examples:

Community Factors

-Marriage and family formation patterns

-Cultural patterns,special taboos,and religious practices

-Education of women,their status and employment outside the home

-Economic patterns - socioeconomic indices

-Nutrition,dietary habits and availability of foods

-Age-distribution of pregnant women

-Parity distribution - spacing, birth order

-Foetal and child loss

-Environmental sanitation

-Prevalent infections and other endemic diseases

-Acceptability and utilisation of Maternal and Child Health and Family Planning services

Individual Factors

-Education

-Age

-Parity

-Obstetrical history

-Previous foetal and child loss

-Socioeconomic status / ethnic group

-Nutrition

-Signs of dysfunction (breathlessness, oedema, pallor)

-Selected clinical measurements

(Source: Risk Approach for Maternal and Child Health Care, WHO Geneva 1978 p.22)

The Malaysian Ministry of Health has identified a set of risk factors in pregnant mothers for use under its High Risk Approach in Maternal Health Care.These are shown below:

LIST OF HIGH RISK FACTORS FOR PREGNANT MOTHERS

1.AGE under 19 and over 35 for primiparous mothers and age over 40 years for multiparous

2.GRAVIDA: 6 and above

3.BIRTH SPACING -below 2 years
-over 5 years

4.BAD OBSTETRIC HISTORY especially APH,PPH (blood loss of >500 cc),2 or more consecutive abortions,stillbirth, prolonged labour (more than 16 and 12 hours for primiparous and multiparous mothers respectively) , previous LSCS, retained placenta, atonic uterus, others

5.MEDICAL PROBLEMS -Heart disease
-Diabetes
-Renal disease
-others

6.WEIGHT :excessive weight gain or unsatisfactory weight gain. Normal Weight Gain:

Up to 20 weeks of gestation	1 kg/mth.
20 to 40 weeks of gestation	0.5 kg/wk.

7.HEIGHT measurement of less than 140 cm

8.MULTIPLE PREGNANCY

9.FOETAL MALPRESENTATION

10.ANAEMIA (Hb of less than 9 gm%) or MALNUTRITION

11.HIGH BLOOD PRESSURE during pregnancy (BP of more than 140/90 mmHg at two consecutive readings)

12.PRE-ECLAMPSIA and ECLAMPSIA

-Pre-eclampsia definition:a condition in the second trimester of pregnancy with blood pressure of 140/90 mmHg or more with or without oedema and albumin in urine.

-Pre-eclampsia classification	BP	Oedema	Albumin
MILD	140/90	-	-
SEVERE Type I	160/100	Moderate	Trace
Type II	140/90	Generalised	Trace
Type III	140/90	Moderate	Solid
Type IV	(Type I,II,III with any of the following:severe headache, vomiting, diarhhoea, vision with flashes of light)		

13.BLEEDING during pregnancy : APH, Abortion

[Guidelines for the Management of High Risk Pregnant Mothers, Maternal and Child Health Unit, Ministry of Health, Malaysia 1987]

4. LITERATURE REVIEW

Various studies in many countries have been done to determine the importance of the various maternal risk factors. Some of their highlights are summarised and quoted below. Due to the fact that the risk factors were studied in various combinations the presentation is not in any particular order but will include general findings and socioeconomic and cultural factors,maternal age, parity, conditions of present pregnancy, previous obstetric history and associated medical problems. Those variables of relevance to this study are underlined.

70 - 80% of newborns with complications originate from high risk obstetric population." [Avery, 1973). In Malaysia more than 55% of maternal deaths occured among women identified as high risk cases. (Karim, 1982).

Geographic areas in the United States with the lowest per capita income and the greatest poverty, have the highest infant mortality rates.In general, States with the highest per capita income have the lowest infant mortality and those at the bottom of the economic ladder, the highest (Gold, 1973).

Traditional women sustained complications (obstetric and neonatal) at a rate greater than twice that of the least traditional, most acculturated women (Boyce et al, 1986).

1,878 women were attended by traditional birth attendants (TBA's), of these 232 (12.4%) were referred to a hospital for delivery.Of 1,878 deliveries the foetal deaths 32 (17 per 1000) and infant deaths 12 (6 per 1000) occured.The death rate was much higher in high risk cases (156 per 1000 referrals,95 for nonreferrals) although some women may have been inappropriately referred while others who should have been were not referred (Janowitz et al, 1985).

The results show that, in quantitative terms, parity and age have the greatest effects on both management and birth outcome (other than birth weight). Stature is also an important factor for certain types of management, and ethnicity, occupation and prenatal class attendance have some significant effects (Dougherty & Jones 1988).

Perinatal mortality rates were significantly higher in nonurban than in urban areas ($p < 0.05$). For early neonatal mortality odds ratios of over 8 were observed for birth weight less than 2500 g or gestation less than 35 weeks. About 75% of early neonatal mortality was attributable to low birth weight
or foetal immaturity (Sillins et al, 1985)

The intellectual abilities of 242 children born to women who had been hypertensive during pregnancy were assessed at the age of 7.5 years.

Associations between 15 maternal, foetal, perinatal, postnatal and environmental factors,and test scores were investigated. Children in the upper social classes, born to non-smokers,who were first born, breast fed and with birth weights above the 10th centile had significantly higher scores in some aspects of ability than the rest. Children whose mothers had developed superimposed pre-eclampsia had higher scores than those whose mothers had not suffered pre-eclampsia; and children delivered by elective caesarian section had lower scores than those delivered spontaneously. In a small subgroup of women with particularly high risk pregnancies perinatal mortality had been 10 times greater than in the rest of the sample. At 7.5 years the intellectual ability of the survivors in this subgroup did not differ from that of the rest (Ounsted et al, 1984).

The perinatal mortality rates (PNMR) were significantly higher at the two extremes of maternal age, in parity 5 and above, and with a previous history of foetal or neonatal loss. Other maternal contributing factors were antepartum haemorrhage, hydramnios and infections. The PNMR dropped precipitously from 340.48 in the birth weight group of 1501 to 2000 g, to 46.6 in the group 2001 to 2500 g. Low birth weight was an important cause of perinatal deaths, and better maternal nutrition and antenatal care could play an important role in reducing this (Ghosh et al, 1983).

Low birth weight is more common in multiple births, low socioeconomic status, nonwhites, very young mothers and women over 35 years of age, first births and infants of high birth order, infants born out of wedlock, female infants, infants born at high altitudes, infants born after a short birth interval, and infants born of short mothers. Low birth weight is more common in women without prenatal care; in women with major complications of pregnancy (toxaemia, placenta praevia, premature separation of placenta, premature rupture of membranes, abnormalities of genital tract, serious illness, etc.); in women with undernutrition (especially protein); in women who have had an unfavourable outcome of previous pregnancy; in women who are heavy cigarette smokers. The evidence of the role of asymptomatic bacteriuria is not clear cut (Wallace, 1981).

Teenage pregnant girls are more likely to have certain problems - excessive weight gain, increased frequency of prolonged labour, toxaemia, caesarean section, cervical laceration, and prematurity. Neonatal and perinatal mortality rates are higher.

Perinatal mortality follows a typical curve; it is high among women aged 15 to 19 years, drops sharply to a low point at ages 20 to 24 years, and climbs rapidly as age increases beyond 30 years. The most vulnerable are the teenage girls and the primipara over 30 years.

Perinatal mortality is higher in first pregnancies, drops in second pregnancies, begins to rise in third pregnancies, is highest in fifth or more pregnancies." [Wallace, 1981).

1) Increasing maternal age was strongly associated with antepartum foetal deaths but not with intrapartum foetal deaths, while older maternal age was also associated with perinatal deaths attributed to congenital anomalies;

2) High parity bore a strong relationship to intrapartum foetal deaths, but none to antepartum foetal deaths, neonatal deaths, or congenital anomaly deaths;

3) For neonatal death, there was a statistically significant ($p < 0.001$) interaction between parity and age such that mothers over 34 years old having their first birth were at especially high risk." [Kiely et al, 1986)

94 mothers aged 17 years and under were studied retrospectively. This study has shown a significant increase in the incidence of low birth weight infants, breech presentation and preterm delivery. Adolescent primigravidas were noted to run a greater risk." [Khwaja et al, 1986).

A retrospective analysis of 646 Arab grandmultiparas. In the grandmultiparas (when compared with the non-grandmultiparas during the same period),

the incidences of gestational diabetes, hypertension, rheumatic heart disease, antepartum and postpartum haemorrhage, and macrosomic infants were increased. However, contrary to some previous reports the incidences of anaemia, caesarian section, induced labour, dysmaturity and perinatal deaths were decreased. This is thought to be due to the provision of modern specialist perinatal care and improved socioeconomic standards." [Mwambingu et al, 1988).

Although there was no statistically significant difference in the frequency of abruptio placentae and placenta praevia in the grandmultiparous women (cf. to the control group of second and third parae), there is a greater tendency of induced preterm delivery. There was also an increased occurence of abnormal presentations and positions. The perinatal mortality was higher. There was also increased incidence of neonatal morbidity." [Tanbo & Bungum, 1987).

657 complete Jerusalem sibships of 7 or more were assessed, including 95 sibships from the socio-economically homogenous ultraorthodox Jewish community of Mea Shearim. In both cross-sectional and longitudinal studies grandmultiparas were not at increased risk for low birth weight, but did have a higher frequency of stillbirths." [Seidman et al, 1987).

Increasing birth weight was directly related to greater maternal weight gain during pregnancy ; and except for cases of weight loss and gains under 11 pounds, progressive increase in weight gain was paralleled by progressive increase in mean birth weight and by progressive decrease in the incidence of low weight infants." [Jacobson, 1973).

The intensive prenatal care group of mothers had (when compared to the adequate, intermediate, inadequate and no prenatal care groups) relatively more pregnancy complications but also the most preferred pregnancy outcomes." [Alexander & Cornely , 1987).

Stillbirth ratio among anaemic mothers (91.0 per 1000 livebirths) was 6 times higher than non-anaemic mothers (15.7 per 1000 livebirths)." [Lwellyn 1965).

Maternal heart disease is an important cause of maternal mortality. Cardiac decompensation during pregnancy favours prematurity. Cyanotic maternal congenital heart disease appears the most consistent heart problem favouring production of infants weighing less than the mean at birth, irrespective of length of gestation.

Maternal diabetes mellitus may result in stillbirth, neonatal death, congenital anomalies, trauma to the newborn, iatrogenic premature delivery, a higher

rate of maternal toxaemia, newborn hypoglycaemia, and other problems.It encompasses almost all causes of infant death or sickness. It may also produce placental insufficiency especially when related to foetal size.

It has been stated that 15% of pregnant patients with asymptomatic bacteriuria will have pyelonephritis in pregnancy, and 21% of patients with persistant or recurrent bacteria after therapy and 18% of pregnant patients with symptomatic pyelonephritis will be delivered of premature infants." [Thompson et al, 1973).

The mean birthweights of infants of both gestational and established diabetics were heavier than that of the general population by race and gestation. 25% of the 92 infants of diabetic mothers have birth weights exceeding the 90th centile of population. True gestational diabetics also showed a 25% incidence of macrosomia." [Kek et al, 1985).

Instrumental deliveries were more common in all types (severe pre-eclampsia, mild pre-eclampsia, hypertension in pregnancy) of hypertensive pregnancy, with 35% frequency of caesarean section in severe pre-eclampsia compared with fewer than 5% for controls (normotensive). Significantly longer hospitalisation and increased perinatal mortality were observed in hypertensive pregnancies, most pronounced in severe pre-eclampsia. The combination of high blood pressure and

proteinuria was associated with the greatest risk for premature birth, low infant weight and perinatal mortality. The overall incidence of hypertensive disorders in pregnancy was relatively low (1.5%), but these women counted for a significant proportion of obstetric complications requiring hospitalisation and instrumental delivery." [Andersch et al, 1984).

64 women who had eclampsia in their previous pregnancies were followed up. 15.6% developed recurrent eclampsia.Of 18 with diastolic blood pressure of more than 80 mmHg or over at booking 22.2% had antepartum or intrapartum eclampsia as compared with -30- only 2.2% of 46 women who with diastolic blood pressure of less than 80 mmHg at booking ($p < 0.01$). There was also a significant association ($p < 0.05$) between the birth weight of the babies and the diastolic blood pressure at booking, and may be a measure of the vascular effect of pre-eclampsia on the placenta." [Adelusi & Ojengbede, 1986).

The incidence of pre-eclampsia in a consecutive series of 642 twin pregnancies was 25.9% compared with 9.7% in singleton pregnancies ($p < 0.001$). In primiparas it was 35.2% and in multiparas 20.4% ($p < 0.001$). Pre-eclampsia in twin pregnancies was of early onset ($p < 0.001$) and the maternal disease more severe as assessed by the incidence of severe hypertension ($p < 0.001$), proteinuria ($p < 0.004$), and eclampsia

($p < 0.01$). Mean birth and placental weights according to gestation, tended to be lower in the severe group compared with uncomplicated cases and those with milder pre-eclampsia, as were also the placental-foetal weight ratios." [Long & Oats, 1987).

Nine precursors of preterm labour were identified: antepartum haemorhhage, poor antenatal attendance, previous delivery of a small baby, multiple pregnancy, proteinuria, grandmultiparity, cervical suture, low maternal weight, and a history of bleeding before 20 weeks." [Chenoweth et al, 1983).

There is a close relationship between the previous obstetric history of the mother and the outcome of the next pregnancy, in the British Perinatal Mortality Study it was found that any patient who has a previous foetal death, previous premature birth, previous stillbirth, or previous neonatal deaths was more likely to have had unfavourable outcome of pregnancy, i.e.perinatal death." [Wallace, 1973).

Risk of miscarriage during a given was found to increase directly with the number of previous miscarriages, but appeared to be unrelated to the order of miscarriages within all previous pregnancies. Maternal age was also highly related to risk with doubled risk seen for women aged older than 40 years compared to women aged 20 years. Risk of miscarriage did not appear to be associated with years since previous

pregnancy, height, weight or obesity." [Risch et al, 1988).

The risk of placenta praevia was 0.26% with an unscarred uterus and increased almost linearly with the number of prior caesarean sections to 10% in patients with 4 or more. Patients presenting with a placenta praevia and an unscarred uterus had a 5% chance risk of clinical placenta accreta. With a placenta praevia and one previous caesarean section, the risk of placenta accreta was 24% ; this risk continued to increase to 67% with a plcenta praevia and 4 or more caesarean sections." [Clark et al, 1985).

Bleeding (per vaginum) in early and late pregnancy due to whatever cause indicates a high risk conceptus." [WHO,)

After 42 weeks of gestation a foetus is in increased risk (2 to 3 times) of dying prior to or during birth. Some postdate foetuses also have varying degrees of intrauterine growth disturbance." [Finbloom & Forman, 1985)

It is admitted that some of the above literature would seem overaddressed with respect to the present study. That arises from an attempt to retain the original context of the various studies quoted whilst taking care not to become absolutely irrelevant.

5. PROBLEM STATEMENT

Maternal health problems still is one of the major health problems in the district of Pasir Puteh, with adverse outcomes in mothers and their foetuses and newborns. About 45% of pregnant mothers in the district are identified as high risk mothers. Even though they are so identified, which means they are targetted for special attention such as being given separate clinic days and are seen and advised more often by doctors, it is found that a large proportion of them are still not sold on the appropriate utilisation of facilities and services like delivering in a hospital when advised to do so.

Therefore it is thought that information about the high risk mothers should be gathered and analysed in order to know their characteristics in greater detail. Perhaps arising from that study some useful conclusions could be made that would help fine-tune the maternal health programme with respect to high risk mothers and in the end would improve utilisation and reduce the adverse outcomes.

CHAPTER II (OBJECTIVE)

1. GENERAL OBJECTIVE

To gather information about high risk pregnant mothers in the District of Pasir Puteh in order to describe them in relation to various characteristics.

2. SPECIFIC OBJECTIVES

2.1. To describe the high risk mothers in relation to socioeconomic characteristics:

- 2.1.1. ethnicity,
- 2.1.2. religion,
- 2.1.3.1. education of mothers,
- 2.1.3.2. education of husbands,
- 2.1.4.1. occupation of mothers,
- 2.1.4.2. occupation of husbands, and
- 2.1.5. distance of residence from nearest health clinic.

2.2. To describe the high risk mothers in relation to maternal factors in pregnancy:

- 2.2.1. age of mothers
- 2.2.2. height of mothers,
- 2.2.3. average weight gain per week,
- 2.2.4. gravidity,
- 2.2.5. parity,
- 2.2.6. abortion
- 2.2.7. stillbirth

2.2.8. previous obstetric history,

2.2.9. risk factors,

2.2.10. haemoglobin level at first antenatal visit.

2.3. To describe the high risk mothers in relation to utilisation of antenatal services:

2.3.1. gestational age at first antenatal visit,

2.3.2. total antenatal visits,

2.3.3. VDRL,

2.3.4. ATT,

2.3.5 examination by doctor,

2.3.6.1. reasons for hospital referral,

2.3.6.2. hospitals of referral

2.3.7. place of birth, and

2.3.8. attendant at birth.

2.4. To describe the high risk mothers in relation to pregnancy outcome at delivery:

2.4.1. gestational age at birth,

2.4.2. birth weight,

2.4.3. maternal complications at birth, and

2.4.4. newborn complications at birth.

CHAPTER III (METHODOLOGY AND LIMITATIONS)

1. THE PLACE AND PERIOD OF STUDY

1.1. The place selected to carry out this survey of high risk pregnant mothers is the District of Pasir Puteh in the State of Kelantan.

1.2. The survey period was about two weeks, from 17/12/1988 to 31/12/1988.

2. THE STUDY POPULATION

2.1. It was decided that the study population should consist of all the high risk pregnant mothers (as identified using the guidelines given by the Ministry of Health - please see page 17) in the District of Pasir Puteh who gave birth during the one year period from 01/12/1987 to 30/11/1988, both dates inclusive. The decision was taken in order to consider only high risk mothers who have completed their pregnancies.

2.2. During that period there were altogether 3576 deliveries in the district. Out of this total 1612 deliveries were by high risk mothers. These 1612 mothers make up the study population. In this survey they are, however, represented by their correct "Antenatal Cards", retrievable documents which contain both their antenatal and, to an extent, birth records.

3. THE STUDY METHODS

3.1. This survey is descriptive, with information obtained from available secondary data. (see above)

3.2. The systematic sampling method was used. All members of the study population were marked out in the Register of high risk pregnant mothers kept at the Pasir Puteh Health Office. The first unit of the sample was randomly picked up by using the table of random numbers. The next 2 units were also picked up as sample units. The following 5 units were not selected. The 9th, 10th and 11th units were selected and again the following 5 units were ignored. The same process was repeated until all the study population were covered, thereby systematically selecting the first 3 units of every consecutive group of 8 units to make up the sample.

4. THE STUDY SAMPLE

4.1. At first it was thought that 150 would be an appropriate and easily manageable sample size. But then it was also thought that the chance of missing some rare variable such as an adverse pregnancy outcome would be fairly great. To double its usefulness the sample size was

quadrupled to about 600.

4.2. Using the systematic sampling method as described above,606 sample units were selected. The sample size was reduced to a final 598 due to absence of any identification (name of mother or registration number) on the study instrument (2), absence of important data like risk factor (4),and document not traceable (2).

5. THE STUDY INSTRUMENT AND WORKERS

5.1. The study instrument is a form (please see APPENDIX A) designed to extract data from the documentary source i.e. the " Antenatal Cards". This form was to be filled by an appointed survey worker.

5.2. The survey workers were made up of about 20 trained midwives, jururawat desa, and staff nurses, headed by the Public Health Sister who also acted as a supervisor beside the author.

6. THE PRETEST

6.1. The only form of pretest performed for this study instrument was the mock filling of forms with data from "Antenatal Cards" during the briefing session for the survey workers prior to data collection proper. The review seemed to be favourable - that the form was adequate and

easily understood.

6.2. (However, almost near the end of the study period it was thought that the survey would be more complete if some additional data were collected - these were: date of last antenatal visit to obtain duration between first and last antenatal visit, date of birth to obtain duration between first antenatal visit and the birth date, and birth weight of newborns. The workers were requested to write the additional data in the form of a number of new lists to be matched later to the main body of data. Since by January 1989 the author had to return to Kuala Lumpur, these had to be sent by post. It would be shown later that this additional arrangement had resulted in the loss of some valuable data. Please note that APPENDIX A is a reconstruction of the original form incorporating the provision for new data.)

7. THE DATA COLLECTION

7.1. Before the commencement of data collection, a briefing session was held for the survey workers where the objectives of the study were explained and their queries answered. The importance of a proper collection of data was also emphasised.

7.2. A list of the relevant selected sample units was given each to a worker in charge of the respective health clinic where the "Antenatal Cards" are kept according to the operational area served by each of the health clinics.

7.3. Each of the appointed workers had to retrieve the selected documents from the file of their own keeping and fill the forms, using data from the documents, themselves. In the case of there being too many documents on a person, she could get assistance from one or more workers who have attended the pre-collection briefing.

7.4. The workers were required to extract data from the documents exactly as they were. If no data were available the relevant parts of the form were to be left blank. There are exceptions to this. For example, the education level of the mothers' husbands were not expected to be found in the "Antenatal Cards". Instead the workers were expected to furnish this information from their own personal knowledge of the families in their areas of service. This was practicable as the workers serve close-knit communities and from their years of service have come to know most if not all of the families they serve on personal basis.

8. DATA PROCESSING

8.1. Most of the data were inputted into a micro-computer for a faster processing and analysis.

8.2. A minority of the data were processed manually espcecially where coding was not originally or needed to be separately prepared, for example concerning variables classified as "others".

8.3. A list of guidelines drawn to assist the author in data processing (especially inputting) is as can be seen in APPENDIX B.

9. LIMITATIONS

9.1. There was no control on the standardisation of procedures performed and instruments used by those who recorded the data in the first place.

9.2. The production and recording of data were done by a number of different people who might not have had the required skills or instructions.

9.3. The documentations may be incomplete.

9.4. Errors could be caused during extraction of data from records.

CHAPTER IV (FINDINGS)

Of the 598 high risk mothers 593(99.2%) were Malays , 3 were Chinese, 1 an Indian and 1 was categorised as "other" (Siamese). Majority (594 or 99.3%) were Muslims, 3 were Buddhists and 1 was a Hindu by religion.

56.2% of the mothers had primary education while 28.1% had secondary education and 14.5% no formal education (table 17). 54.2% of the mothers' husbands had primary education, 29.2% had secondary education and 13.5% no formal education (table 18).

Most of the mothers were housewives (95.5%) (table 19). In the case of the husbands 79.6% were self employed especially as padi farmers while the rest were either in the government sector (16.4%) or private sector (3.9%) (table 20). 71.6% of the mothers lived less than 5 km away from the nearest health clinic while the rest lived 5 km or more away (table 21).

At the first antenatal visit about half the mothers (58.6%) were between the ages 30 to 39 years. Majority (74.5%) were between 25 to 39 years old (table 22).

Only 5 (0.8%) of the mothers were less than 140 cm in height. The rest were more than 140 cm tall (table 23). Most of the mothers (80.0%) gained an average

Table 17.

DISTRIBUTION OF HIGH RISK MOTHERS
BY EDUCATION LEVEL

EDUCATION LEVEL	NO. OF MOTHERS	(%)
No Formal Education	37	(14.5)
Primary Education	336	(56.2)
Secondary Education	168	(28.1)
Pre-university, Diploma and Higher	7	(1.2)
TOTAL	598	(100%)

(See Figure 2)

Table 18.

DISTRIBUTION OF HUSBANDS OF HIGH RISK PREGNANT MOTHERS BY EDUCATION LEVEL

EDUCATION LEVEL	NO. OF HUSBANDS	(%)
No Formal Education	79	(13.5)
Primary Education	317	(54.2)
Secondary Education	171	(29.2)
Pre-university, Diploma and Higher	18	(3.1)
TOTAL	*585	(100%)

* Data not available for 13 husbands

(See Figure 2)

Figure 2. BAR CHART PRESENTATION OF THE DISTRIBUTION OF BOTH MOTHERS AND THEIR HUSBANDS BY EDUCATION LEVEL

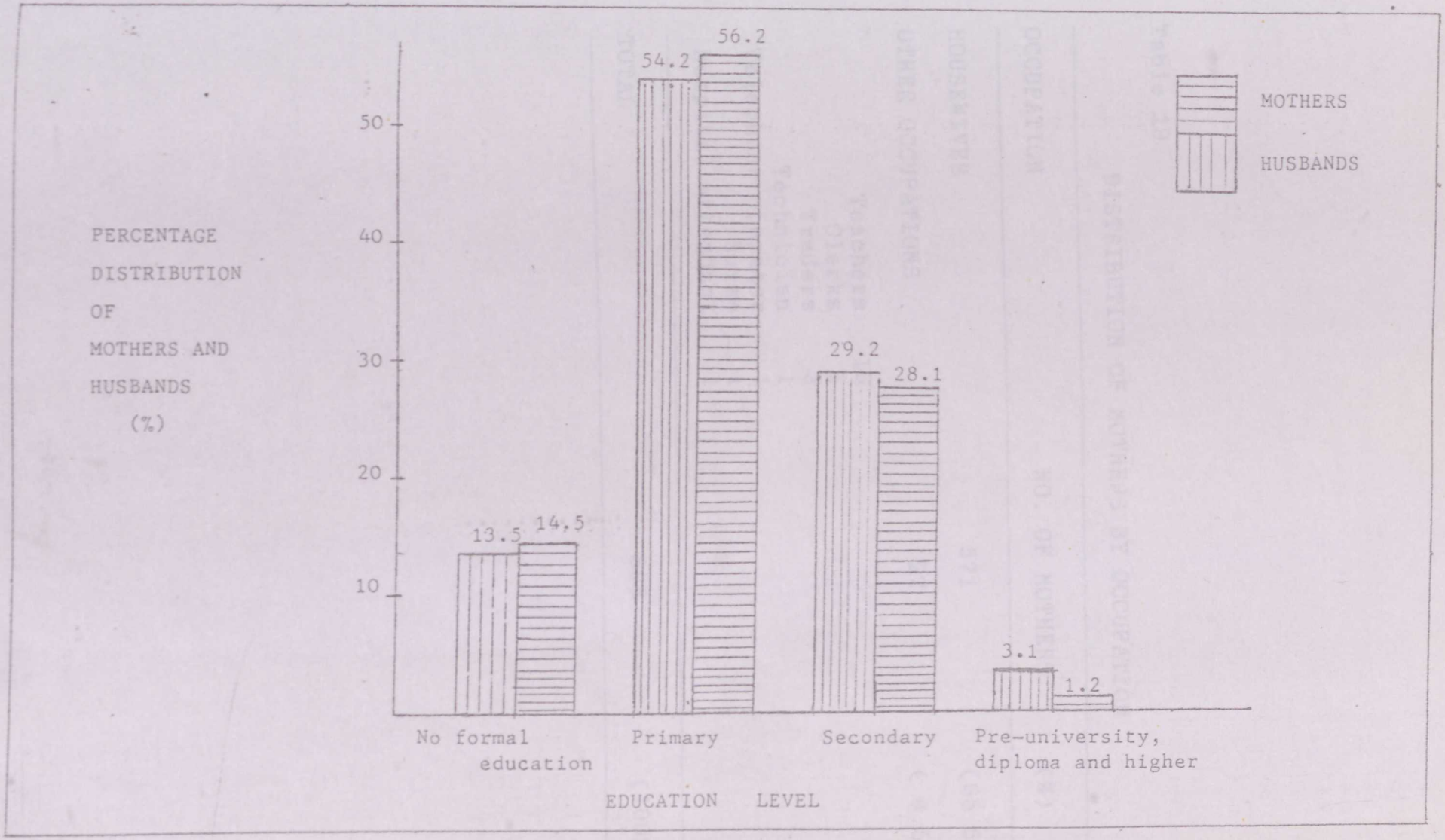


Table 19.

DISTRIBUTION OF MOTHERS BY OCCUPATION

OCCUPATION		NO. OF MOTHERS	(%)
HOUSEWIVES		571	(95.5)
OTHER OCCUPATIONS		27	(4.5)
Teachers	16		
Clerks	4		
Traders	3		
Technician	1		
Telephone operator	1		
Nurse	1		
Hospital attendant	1		
TOTAL		598	(100%)

Table 20.

DISTRIBUTION OF HUSBANDS BY OCCUPATION

CLASSIFICATION / OCCUPATIONS	NO. OF HUSBANDS		(%)
A)SELF-EMPLOYED		473	(79.6)
Agriculture/fishing:	332(56.0)		
Padi farmers	296(49.9)		
Rubber tappers	13		
Tobacco farmers	3		
Land scheme settler	1		
Fishermen	19		
Trade:	71(12.0)		
Traders	61(10.3)		
Carpenters	3		
Keropok manufacturer	1		
Service:	59 (9.9)		
Drivers	27		
Bomohs	11		
Mechanics	9		
Labourers	8		
Trishaw pullers	3		
Barber	1		
Odd jobs:	11 (1.9)		
B)GOVERNMENT EMPLOYEES		97	(16.4)
Administrative/clerical:	21 (3.5)		
Mosque officials	7		
Clerks	7		
Supervisors	4		
Penghulus	2		
Administrator	1		
Skilled/service workers:	76(12.8)		
Teachers	25		
Soldiers/Policemen	20		
Drivers	9		
Gardeners	7		
Labourers	6		
Technicians	5		
Postmen	2		
Guards	2		
Others	5		
C)PRIVATE SECTOR EMPLOYEES	23	23	(3.9)
Labourers	13		
Drivers	8		
Supervisor	1		
Operator	1		
TOTAL		*593	(100%)

* Data not available for 5 husbands

Table 21.

DISTRIBUTION OF MOTHERS
BY DISTANCE OF RESIDENCE FROM NEAREST HEALTH CLINIC

DISTANCE	NO. OF MOTHERS	(%)
Less than 5 km	420	(71.6)
5 km and more	167	(21.4)
TOTAL	*587	(100%)

* Data not available for 11 mothers

Table 22.

DISTRIBUTION OF MOTHERS BY AGE GROUP

AGE GROUP (YEARS)	NO. OF MOTHERS	(%)
10 - 14	2	(0.7)
15 - 19	39	(6.5)
20 - 24	59	(9.8)
25 - 29	95	(15.9)
30 - 34	176	(29.4)
35 - 39	175	(29.2)
40 - 44	48	(8.0)
45 - 50	4	(0.7)
TOTAL	598	(100%)

(See Figure 3)

Figure 3. DISTRIBUTION OF MOTHERS BY AGE GROUP AT FIRST ANTENATAL VISIT

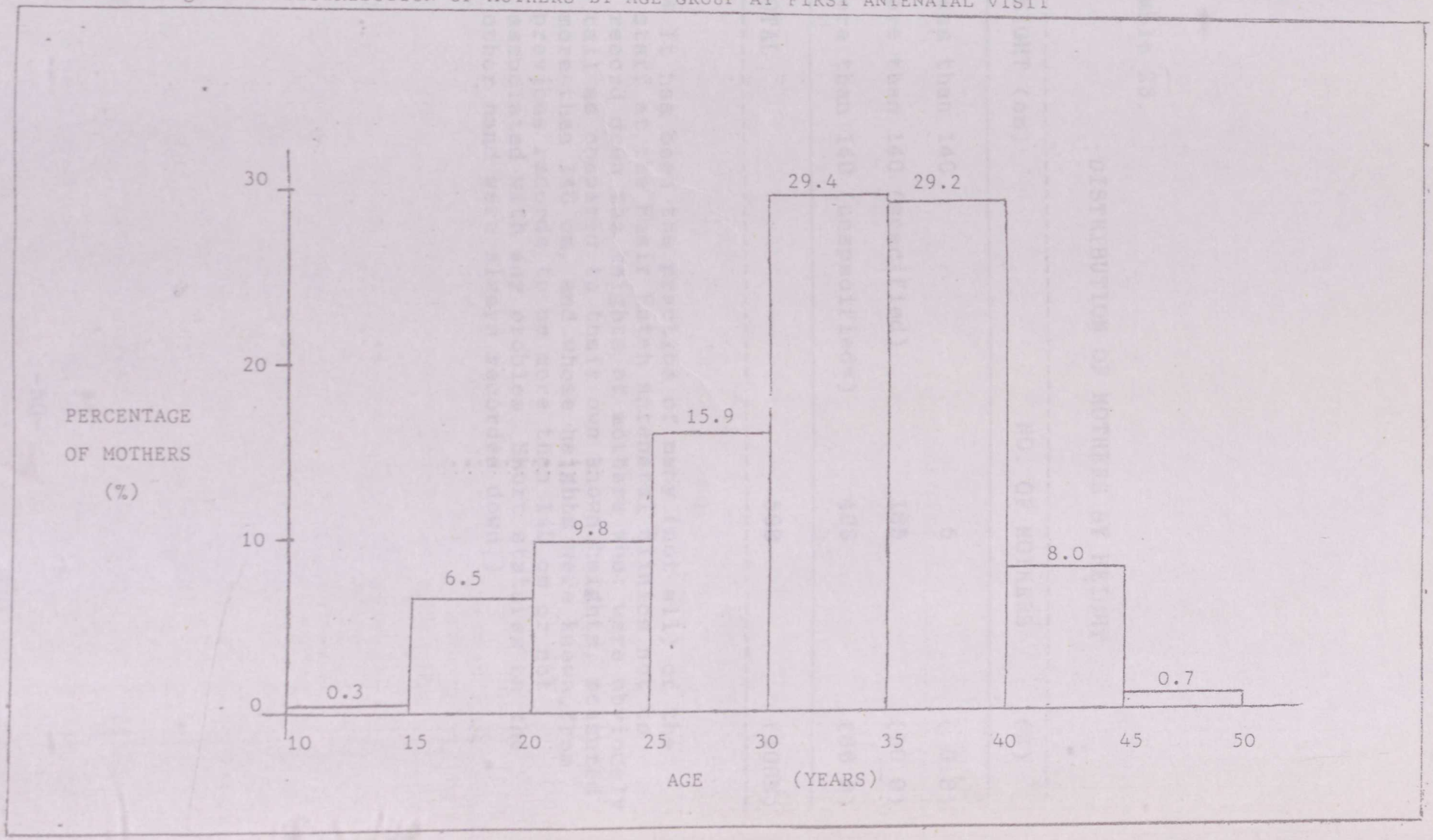


Table 23.

DISTRIBUTION OF MOTHERS BY HEIGHT

HEIGHT (cm)	NO. OF MOTHERS	(%)
Less than 140	5	(0.8)
More than 140 (specified)	185	(30.9)
More than 140 (unspecified*)	408	(68.2)
TOTAL	598	(100%)

(* It has been the practice of many (not all) of the staff at the Pasir Puteh antenatal clinics not to record down the heights of mothers who: were obviously tall as compared to their own known heights, measured more than 140 cm, and whose heights were known from previous records to be more than 140 cm or not associated with any problem. Short statures on the other hand were always recorded down.)

of 0 -0.4 kg per week during the period between their first antenatal visit and birth of their child (table 24).

64.8% were gravida 6 or more at their last pregnancy while 12.2% were gravida 1 (table 25). In general all gravida groups were mainly 20 - 34 years old. However a large number of the gravida 6 and more group were found to be 35 - 39 years and in the 40 years and above groups (table 26). A similar pattern is observed for the parity groups (tables 27 and 28).

17.4% of the mothers have had an abortion in the past. 83 (14.0%) have had 1 abortion each, 19 (3.2%) have had 2 abortions each and 1 (0.2%) had 3 or more abortions (table 29). Stillbirth were experienced by 43 (7.3%) mothers and among these 37 had a history of 1 stillbirth each, 5 had 2 stillbirths and 1 had 3 or more stillbirths (table 30).

Apart from stillbirths the other common problems encountered in their previous obstetric history included caesarean section, prolonged labour, multiple non-habitual abortions, single abortion and multiple pregnancies (table 31).

Of the 598 mothers most had 1 risk factor (57.2%) while 34.6% had 2 risk factors, 5.4% 3 risk factors and 2.8% 4 or more risk factors (table 32). Common risk factors were grandmultiparity (44.6%), spacing between pregnancies of less than 2 years (11.3%), bad obstetric

Table 24.

DISTRIBUTION OF MOTHERS BY WEIGHT GAIN

AVERAGE WEIGHT GAIN (kg) PER WEEK	NO. OF MOTHERS	(%)
0.0 - 0.4	308	(80.0)
0.5 - 0.9	75	(19.5)
1.0 - 1.4	2	(0.5)
TOTAL	*385	(100%)

* Weight gain for 213 mothers were not calculated because the dates of last antenatal visit were not available thereby unavailabling the denominator required in the calculation for it. (The additional data could not be matched to the main body of data.)

Table 25.

DISTRIBUTION OF MOTHERS BY GRAVIDITY

GRAVIDA	NO. OF MOTHERS	(%)
1	72	(12.2)
2	28	(4.7)
3	29	(4.9)
4	28	(4.7)
5	28	(4.7)
6	105	(17.8)
7	95	(16.1)
8	82	(13.9)
9	51	(8.6)
10	41	(6.9)
11	10	(1.7)
12	13	(2.2)
13	5	(0.8)
14	1	(0.2)
15	1	(0.2)
16	2	(0.3)
TOTAL	*591	(100%)

* Data not known for 7 mothers

(See Figure 4)

Figure 4. OBSTETRIC STATUS AT LAST PREGNANCY OF HIGH RISK MOTHERS BY GRAVIDITY AND PARITY

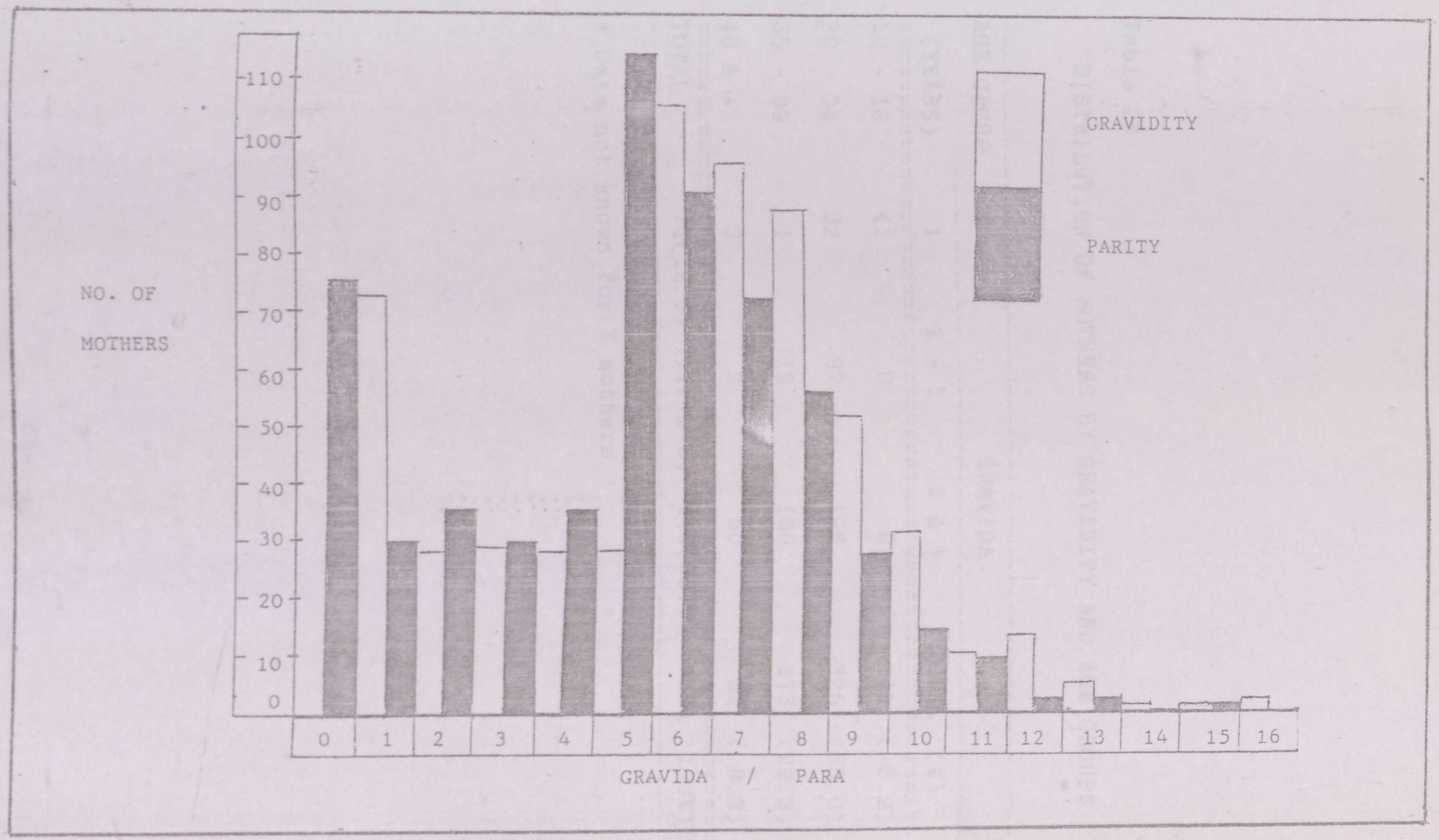


Table 26.

DISTRIBUTION OF MOTHERS BY GRAVIDITY AND AGE GROUPS

AGE GROUP	GRAVIDA				
(YEARS)	1	2 - 5	6 & +	TOTAL	(%)
10 - 19	41	0	0	41	(6.9)
20 - 34	32	97	196	325	(55.0)
35 - 39	1	12	160	173	(29.3)
40 & +	0	2	50	52	(8.8)
TOTAL	74(12.5)	111(18.8)	406(68.7)	*591	(100%)

* Data not known for 7 mothers

Table 27.

DISTRIBUTION OF MOTHERS BY PARITY

PARA	NO. OF MOTHERS	(%)
0	75	(12.7)
1	30	(5.1)
2	35	(5.9)
3	30	(5.1)
4	35	(5.9)
5	114	(19.3)
6	90	(15.2)
7	72	(12.2)
8	55	(9.3)
9	27	(4.6)
10	14	(2.4)
11	9	(1.5)
12	2	(0.3)
13	2	(0.3)
14	0	(0.0)
15	1	(0.2)
16	0	(0.0)
TOTAL	*591	(100%)

* Data not available for 7 mothers

(See Figure 4)

Table 28.

DISTRIBUTION OF MOTHERS BY PARITY AND AGE GROUP

AGE GROUP (YEARS)	PARITY 0	1 - 4	5&+	TOTAL	(%)
10 - 19	37	1	0	78	(6.4)
20 - 34	35	107	184	326	(55.2)
35 - 39	3	20	152	175	(29.6)
40 & +	0	2	50	52	(8.8)
TOTAL	75(12.7)	130(22.0)	386(65.3)	*591	(100%)

* Data not available for 7 mothers

Table 29.

DISTRIBUTION OF MOTHERS BY NUMBER OF ABORTIONS

NO. OF ABORTIONS	NO. OF MOTHERS		(%)
0	488		(82.6)
1	83 (14.0)		
2	19 (3.2)	103	(17.4)
3 & +	1 (0.2)		
TOTAL	*591		(100%)

* Data not available for 7 mothers

Table 30.

DISTRIBUTION OF MOTHERS BY NUMBER OF STILLBIRTHS

NO. OF STILLBIRTHS	NO. OF MOTHERS	(%)
0	548	(92.7)
1	37 (6.3)	
2	5 (0.8)	43 (7.3)
3 & +	1 (0.2)	
TOTAL	*591	(100%)

* Data not available for 7 mothers

Table 31.

DISTRIBUTION OF MOTHERS
ACCORDING TO PREVIOUS OBSTETRIC HISTORY

PREVIOUS OBSTETRIC HISTORY	NO. OF MOTHERS		(%)
NIL OF NOTE			387 (64.7)
SINGLE ABORTION			83 (13.9)
STILLBIRTHS	43	(7.3)	
PREVIOUS CAESAREAN SECTION	12	(2.0)	
PROLONGED LABOUR	12	(2.0)	
HABITUAL ABORTION	8	(1.3)	211 (35.3)
POSTPARTUM HAEMORRHAGE	8	(1.3)	
ANTEPARTUM HAEMORRHAGE	6	(1.0)	
OTHERS	39	(6.5)	
Multiple non-habitual abortions	12		
Multiple pregnancy	12		
Premature labour	7		
Retained placenta	5		
Postpartum psychosis	1		
Postpartum paralysis	1		
Instrumental (forceps) delivery	1		
TOTAL			598 (100%)

Table 32.

DISTRIBUTION OF MOTHERS
ACCORDING TO NUMBER OF RISK FACTORS

NO. OF RISK FACTORS	NO. OF MOTHERS	(%)
1	342	(57.2)
2	207	(34.6)
3	32	(5.4)
4*	17	(2.8)
TOTAL	598	(100%)

* Only a maximum of 4 risk factors were recorded per mother, selecting the subjectively more important

history (10.3%), primiparity (7.8%) and anaemia (6.7%) (table 33).

For those who were first gravida the most common risk factors were age less than 19 years, height less than 140 cm and anaemia. Spacing of less than 2 years between pregnancies and anaemia predominated for those of 2nd to 5th gravida and those who were gravida 6 or more. In the latter group, age of mothers 40 years and more was an important risk factor too. It was also seen that 6th gravida or more was a common risk factor irrespective of whether the mothers had no formal education, primary education or secondary education (tables 34 and 35).

Severe anaemia (Hb below 7.0 g%) was seen in only 2 (0.3%) mothers while moderate anaemia (Hb level of 7.0 g% to below 9.0 g% was seen in 9 mothers (1.6%). The rest had borderline (9.0 g% to below 10.0 g%) or satisfactory (Hb level of 10.0 g% and above) levels (table 36).

Almost half of the mothers belong to the group with gestational age at first antenatal visit of 22 - 27 weeks (49.5%). 34.3% had gestational age between 16 - 21 weeks. A similar observation is seen in all age groups of the mothers (table 38). 66 of 71 mothers of first gravida were between 16 - 27 weeks of gestational age at first antenatal visit. Similarly 87 of 111

Table 33.

DISTRIBUTION OF MOTHERS
ACCORDING TO TYPES OF RISK FACTORS

RISK FACTOR	NUMBER OF MOTHERS	(%)
GRAVIDA 6 AND ABOVE	410	(44.6)
SPACING < 2 YEARS	104	(11.3)
BAD OBSTETRIC HISTORY	95	(10.3)
PRIMIPARA	72	(7.8)
ANAEMIA	61	(6.7)
AGE > 40 MULTIPARA	45	(4.9)
AGE < 19	34	(3.7)
SPACING > 5 YEARS	23	(2.5)
HYPERTENSION	22	(2.4)
PREECLAMPSIA 15 (1.63) AND ECLAMPSIA 4 (0.43)	19	(2.1)
PREVIOUS LSCS	12	(1.3)
MALPRESENTATION	7	(0.8)
HEIGHT < 140 cm	5	(0.5)
MULTIPLE PREGNANCY	5	(0.5)
AGE > 35 PRIMIPARA	2	(0.2)
ANTEPARTUM HAEMORRHAGE	2	(0.2)
HEART DISEASE	1	(0.1)
OTHER DISEASE (Asthma)	1	(0.1)
TOTAL	*920	(100%)

* Many of the mothers have more than one risk factor.

Table 34.

DISTRIBUTION OF MOTHERS
ACCORDING TO AGE GROUP AND COMMON RISK FACTORS

AGE GROUP (YEARS)	RISK FACTOR	PROPORTION OF MOTHERS	(%)
10 - 19	Primipara	32/41	(74.0)
	Anaemia	3/41	(7.3)
20 - 29	Spacing<2yr	51/154	(33.1)
	Gravida 6&+	50/154	(32.5)
	Anaemia	20/154	(13.0)
	*BOH	17/154	(11.0)
30 - 39	Gravida 6&+	311/351	(88.6)
	Spacing<2yr	46/351	(13.1)
	Anaemia	33/351	(9.4)
	BOH	27/351	(7.7)
40 & above	Gravida 6&+	49/52	(94.2)
	Multip>40yr	45/52	(86.5)
	BOH	8/52	(15.4)

* Bad obstetric history.

Table 35.

DISTRIBUTION OF MOTHERS ACCORDING TO GRAVIDITY AND COMMON RISK FACTORS

GRAVIDA	RISK FACTOR	PROPORTION OF MOTHERS	(%)
1	Age < 19	32/72	(44.4)
	Height < 140 cm	5/72	(6.9)
	Anaemia	5/72	(6.9)
2 - 5	Spacing < 2 yr	45/113	(39.8)
	Anaemia	18/113	(15.9)
	*BOH	18/113	(15.9)
6 & +	Spacing < 2 yr	54/407	(13.3)
	Age 40 yr +	44/407	(10.8)
	Anaemia	38/407	(9.3)
	BOH	33/407	(8.1)
	Hypertension	14/407	(3.4)

* Bad obstetric history.

Table 36.

DISTRIBUTION OF MOTHERS ACCORDING TO EDUCATION LEVEL AND COMMON RISK FACTORS

EDUCATION	RISK FACTOR	PROPORTION OF MOTHERS	(%)
No formal education	Gravida 6&+	59/87	(67.8)
	Spacing<2yr	14/87	(16.1)
	Multip>40yr	14/87	(16.1)
	Anaemia	10/87	(11.5)
	*BOH	9/87	(10.3)
Primary	Gravida 6&+	272/336	(81.0)
	Spacing<2yr	48/336	(14.3)
	Anaemia	39/336	(11.6)
	BOH	33/336	(9.8)
	Multip>40yr	28/336	(8.3)
Secondary	Gravida 6&+	74/168	(44.0)
	Primipara	43/168	(25.6)
	Spacing<2yr	36/168	(21.4)
	BOH	12/168	(7.1)

* Bad obstetric history.

Table 37.

DISTRIBUTION OF MOTHERS
ACCORDING TO HAEMOGLOBIN LEVEL
AT FIRST ANTENATAL VISIT

Hb LEVEL (g%)	NO. OF MOTHERS	(%)
5.0 - 6.9	2	(0.3)
7.0 - 8.9	9	(1.6)
9.0 - 9.9	44	(7.7)
10.0 & above	517	(90.4)
TOTAL	*572	(100%)

* Data not available for 26 mothers

Table 38.

DISTRIBUTION OF MOTHERS BY
GESTATIONAL AGE AT FIRST ANTENATAL VISIT AND AGE GROUP

AGE GROUP (YEARS)	GESTATIONAL AGE (WEEKS)					
	<16	16-21	22-27	28-33	34 & above	TOTAL (%)
10 - 19	0	20	18	3	0	41(3.0)
20 - 29	15	43	72	20	0	150(25.6)
30 - 39	10	128	169	35	3	345(58.9)
40 - 49	2	10	31	7	0	50(8.5)
TOTAL	27 (4.6)	201 (34.3)	290 (49.5)	65 (11.1)	3 (0.5)	*586 (100%)

* Data not available for 12 mothers.

mothers belonging to the 2nd - 5th gravida group and 335 of 397 mothers of gravida 6 and above (84.4%) were within the gestational age range of 16 to 27 weeks at their first antenatal visit (Table 39). It is seen that the majority of mothers at all levels of education first attended antenatal clinics at the gestational age of 16 - 27 weeks (84.0%) (Table 40).

66.0% of mothers had less than 8 total antenatal visits while 34.0% had more than 8 visiits. In the group 19 years and below the number of mothers with visits less than 8 and 8 and more are almost equal but in the age groups 20 - 29 and 30 - 39 and 40 and above years mothers with less than 8 visits almost double those with more than 8 visits (Table 41). There does not seem to be any difference between the groups of mothers with no formal education, primary education, secondary education or higher with respect to the total number of antenatal visits. All the educational levels showed about twice as many mothers with less than 8 visits as those with 8 or more visits (Table 42). The range of total number of visits is from 1 to as many as 15 visits. 19.9% had 5 visits or less. 75.5% had 6 - 10 visits and 4.9% had 11 or more visits (Table 43).

98.5% of all mothers had their blood tests for VDRL done. 1.2% had positive results and 96.7% of those done

Table 39.

DISTRIBUTION OF MOTHERS BY
GESTATIONAL AGE AT FIRST ANTENATAL VISIT AND GRAVIDITY

GRAVIDA	GESTATIONAL AGE (WEEKS)					
	<16	16-21	22-27	28-33	34 & above	TOTAL (%)
1	6	33	30	2	0	71(12.3)
2 - 5	6	32	55	17	1	111(19.2)
6 & +	15	135	200	45	2	397(68.6)
TOTAL	27 (4.7)	200 (34.5)	285 (38.7)	64 (11.1)	3 (0.5)	*579 (100%)

* Data not available for 19 mothers.

Table 40.

DISTRIBUTION OF MOTHERS ACCORDING TO GESTATIONAL AGE AT FIRST ANTENATAL VISIT AND EDUCATION

EDUCATION	GESTATIONAL AGE (WEEKS)					
	<16	16-21	22-27	28-33	34 & above	TOTAL (%)
No formal education	2	20	50	11	1	84(14.4)
Primary	18	117	156	36	1	328(56.1)
Secondary	6	61	82	16	1	166(28.4)
Higher	1	3	1	2	0	7(1.2)
TOTAL	27 (4.6)	201 (34.6)	289 (49.4)	65 (11.1)	3 (0.5)	*585 (100%)

* Data for 12 mothers not available
  Data for 1 mother not classifiable

Table 41.

DISTRIBUTION OF MOTHERS ACCORDING TO
AGE GROUP AND TOTAL NUMBER OF ANTENATAL VISITS

AGE GROUP (YEARS)	TOTAL NO. OF ANTENATAL VISITS			
	<8	8 & ABOVE	TOTAL	(%)
10 - 19	21 (51.2)	20 (48.8)	41	(100%)
20 - 29	95 (61.7)	59 (38.3)	154	(100%)
30 - 39	239 (68.1)	112 (31.9)	351	(100%)
40 & above	39 (75.0)	13 (25.0)	52	(100%)
TOTAL	394 (66.0)	203 (34.0)	*597	(100%)

* Data not available for 1 mother

Table 42.

DISTRIBUTION OF MOTHERS ACCORDING TO TOTAL NUMBER OF ANTENATAL VISITS AND EDUCATION

EDUCATION	TOTAL NO. OF ANTENATAL VISITS			
	<8	8 & ABOVE	TOTAL	(%)
No formal education	63	24	87	(14.6)
Primary	215	120	335	(56.1)
Secondary	111	57	168	(28.1)
Higher	5	2	7	(1.2)
TOTAL	394 (66.0)	203 (34.0)	*597	(100%)

* Data not available for 1 mother

PERPUSTAKAAN UNIVERSITI MALAYA

Table 43.

DISTRIBUTION OF MOTHERS
BY NUMBER OF TOTAL ANTENATAL VISITS

NO. OF ANTENATAL VISITS	NO. OF MOTHERS	(%)
1	1	(0.2)
2	4	(0.7)
3	25	(4.2)
4	62	(10.4)
5	86	(14.4)
6	118	(19.7)
7	98	(16.4)
8	98	(16.4)
9	52	(8.7)
10	24	(4.0)
11	16	(2.7)
12	4	(0.7)
13	0	(0.0)
14	8	(1.3)
15	1	(0.2)
TOTAL	598	(100%)

Table 44.

DISTRIBUTION OF MOTHERS BY STATUS OF VDRL

STATUS OF VDRL	NO. OF MOTHERS	(%)
VDRL not done	9	(1.5)
VDRL +ve, TPHA +ve with complete treatment	6	(1.0)
VDRL +ve, TPHA +ve with incomplete treatment	1	(0.2)
VDRL +ve, TPHA -ve	4	(0.7)
VDRL -ve	578	(96.7)
TOTAL	598	(100%)

had negative results and 1 mother (0.27%) did not have complete treatment though her VDRL test was positive (Table 44). 92.0% of mothers received their ATT injections during their last pregnancy and 8.1% were not given (Table 45).

The majority of the mothers (77.3%) had 1 or 2 antenatal examinations by a doctor. The rest of the mothers were examined by a doctor for 3 up to 8 times, their numbers decrease as the number of examinations increase (Table 46).

Only 28.8% of the mothers were ever referred to a hospital in the last pregnancy. The majority of referrals were because of antenatal complications (Table 47). 83.3% of the referrals were directed to the University Hospital. The rest were referred to two district hospitals (Table 48).

63.8% of the mothers delivered at home while 36.2% delivered in hospitals. The number of mothers with hospital and home deliveries are almost equal for the extreme age groups under 19 years and 40 years and above but the number of home deliveries far exceed hospital deliveries in the age groups 20 - 29 and 30 - 39 years (Table 49). In both the groups of mothers who lived within 5 km away from the nearest health clinic, home deliveries exceed the hospital deliveries by about 2 times. Distance from clinic does not seem to have any significance in determining place of delivery(Table 50).

Table 45.

DISTRIBUTION OF MOTHERS BY STATUS OF *ATT

STATUS OF ATT	NO. OF MOTHERS	(%)
ATT not given	48	(8.1)
Given dose 1 & 2 (primip)	67	(11.3)
Given booster dose (multip)	480	(80.7)
TOTAL	**595	(100%)

* Antitetanus toxoid

** Data not available for 3 mothers

Table 46.

DISTRIBUTION OF MOTHERS ACCORDING TO TOTAL NUMBER OF ANTENATAL EXAMINATIONS BY DOCTOR

NO. OF EXAMINATIONS	NO. OF MOTHERS	(%)
1	252	(42.6)
2	225	(34.7)
3	70	(11.8)
4	27	(4.6)
5	20	(3.4)
6	14	(2.4)
7	1	(0.2)
8	2	(0.3)
TOTAL	*591	(100%)

* Data not available for 7 mothers

Table 47.

DISTRIBUTION OF REFERRALS OF MOTHERS TO HOSPITALS ACCORDING TO REASONS FOR REFERRAL

REASONS FOR REFERRAL	NO. OF MOTHERS	(%)
(Not referred)	425	(71.3)
Antenatal complications	150	(25.1)
Further investigations	17	(2.8)
Specialist treatment	3	(0.5)
Second opinion	2	(0.3)
TOTAL	*597	(100%)

* Data not available for 1 mother

Table 48.

DISTRIBUTION OF MOTHERS ACCORDING TO HOSPITAL OF REFERRAL

HOSPITAL	NO. OF REFERRALS		(%)
Besut District Hospital	27	28	(16.5)
Machang District Hospital	1		
Hospital of *USM	141		(83.3)
TOTAL	**169		(100%)

* USM = Universiti Sains Malaysia (Science University of Malaysia)

** Data not available for 3 mothers

Table 49.

DISTRIBUTION OF MOTHERS
BY AGE GROUP AND PLACE OF DELIVERY

AGE GROUP (YEARS)	PLACE OF DELIVERY			
	Home	District Hospital	University Hospital	TOTAL (%)
10 - 19	22(53.7)	5(12.2)	14(34.1)	41 (100%)
20 - 29	98(65.8)	14(9.4)	37(24.8)	149 (100%)
30 - 39	229(66.6)	28(8.1)	87(25.3)	344 (100%)
40 & above	25(48.1)	7(13.5)	20(38.5)	52 (100%)
TOTAL	374(63.8)	54(9.2)	158(27.0)	*586 (100%)

* Data not available for 12 mothers

Table 50.

DISTRIBUTION OF MOTHERS ACCORDING TO DISTANCE FROM NEAREST HEALTH CLINIC AND PLACE OF DELIVERY

DISTANCE	PLACE OF BIRTH			
	Home	Hospital	TOTAL	(%)
< 5 km	259 (69.3)	160 (75.5)	419	(71.5)
5 km & above	115 (30.7)	52 (24.5)	167	(28.5)
TOTAL	374 (100%)	212 (100%)	*586	(100%)

* Data for 12 mothers not available

2.7% of home deliveries ended up in complications whereas 2.1% of District Hospital deliveries and 11.3% of University Hospital deliveries ended up in complications (Table 51).

25 deliveries (4.3%) were unattended (BBA), 15 (2.6%) attended by traditional birth attendants (TBA), 60.8% by trained midwives, 23.1% by doctors and 9.2% by unidentified hospital staff. In all age groups the majority were delivered by trained personnel (trained midwives and doctors). The age group 30 - 39 years dominates with respect to all types of birth attendants (Table 52). In all educational levels the majority of deliveries were conducted by trained personnel. Also in all educational levels the majority of deliveries were attended by trained midwives (Table 53). The unattended deliveries seem to have no complications. The highest complications occured in deliveries attended by "other" (other trained but unidentified hospital staff) (9.3%) followed by deliveries attended by doctor (8.9%) and traditional birth attendant (7.1%). Only 2.1% of complications occured in deliveries conducted by trained midwives (Table 54). For all types of attendants the number of mothers belonging to the group less than 5 km from the nearest clinic exceed the mothers of 5 or more km away by 2 times or more (Table 55).

74.8% of 416 newborns were born mature (38 weeks or more by gestational age), 25% were premature, and 1

Table 51.

DISTRIBUTION OF MOTHERS ACCORDING TO
PLACE OF DELIVERY AND COMPLICATIONS OF DELIVERY

COMPLICATIONS OF DELIVERY	PLACE OF DELIVERY				
	Home	DH	UH	Other	TOTAL (%)
No	364(97.3)	53(98.1)	142(89.9)	1	560 (95.4)
Yes	10(2.7)	1(1.9)	16(10.1)	0	27 (4.6)
TOTAL	374(100)	54(100)	158(100)	1	*587 (100%)

* Data not available for 11 mothers

DH = District Hospital

UH = University Hospital

Table 52.

DISTRIBUTION OF MOTHERS ACCORDING TO AGE GROUP AND ATTENDANT AT BIRTH

AGE GROUP (YEARS)	ATTENDANT AT BIRTH					
	BBA	TBA	MW	DR	OTHER	TOTAL(%)
10 - 19	2	0	23	10	6	41(7.0)
20 - 29	6	4	95	28	16	149(25.5)
30 - 39	13	10	214	77	28	342(58.6)
40 & above	4	1	23	20	4	52(8.9)
TOTAL	25	15	355	135	54	*584
(%)	(4.3)	(2.6)	(60.8)	(23.1)	(9.2)	(100%)

* Data not available for 14 mothers

BBA = born before arrival (of attendant)

TBA = traditional birth attendant

MW = trained midwife

DR = doctor

OTHER = other trained but unidentified hospital personnel

Table 53.

DISTRIBUTION OF MOTHERS ACCORDING TO EDUCATIONAL LEVEL AND ATTENDANT AT BIRTH

EDUCATION	BBA	TBA	MW	DR	OTHER	TOTAL
No formal education	7	2	49	19	8	85
Primary	13	8	214	68	25	328
Secondary	4	5	89	46	20	164
Higher	1	0	3	2	1	7
TOTAL	25	15	165	135	54	*584

* Data not available for 14 mothers

Table 54.

DISTRIBUTION OF MOTHERS ACCORDING TO ATTENDANT AT BIRTH AND COMPLICATION OF DELIVERY

COMPLICATIONS	BBA	TBA	MW	DR	OTHER	TOTAL
No	25 (100)	14 (93.3)	346 (97.5)	123 (91.1)	49 (90.7)	557 (95.4)
Yes	0	1 (6.7)	9 (2.5)	12 (8.9)	5 (9.3)	27 (4.5)
TOTAL (%)	25 (100%)	15 (100%)	355 (100%)	135 (100%)	54 (100%)	*584 (100%)

* Data for 14 mothers not available

Table 55.

DISTRIBUTION OF MOTHERS ACCORDING TO
DISTANCE FROM HEALTH CLINIC AND ATTENDANT AT BIRTH

DISTANCE	BBA	TBA	MW	DR	OTHER	TOTAL
< 5 km	19 (76.0)	10 (66.7)	250 (70.4)	82 (60.7)	48 (88.9)	409 (70.0)
5 km & above	6 (24.0)	5 (33.3)	105 (29.6)	53 (39.3)	6 (11.1)	175 (30.0)
TOTAL	25 (100.0)	15 (100.0)	355 (100.0)	135 (100.0)	54 (100.0)	*584 (100.0)

* Data not available for 14 mothers

Table 56.

DISTRIBUTION OF NEWBORNS
ACCORDING TO GESTATIONAL AGE AT BIRTH

GESTATION (WEEKS)	NO. OF NEWBORNS	(%)
27 & below	1	(0.2)
28 - 37	104	(25.0)
38 - 40	185	(44.5)
41 & above	126	(30.3)
TOTAL	*416	(100%)

* Gestational age at birth was not available for 175 (29.3%) of the newborns

(0.2%) was technically an abortus (gestational age 27 weeks or less) (Table 56).

23 newborns (5.5%) were under 2.5 kg and the rest were 2.5 kg or more. The median weight were 3.15 kg (Table 57).

56.5% of preterm newborns were found to weigh less than 2.5 kg and 3.3% of term newborns weigh less than 2.5 kg. 23.5% of newborns with birthweights of 2.5 kg and above were preterm and 76.5% were term (Table 58).

The major maternal complications at birth were caesarean sections (24), prolonged (7), breech delivery (6), and instrumental delivery (7) out of 50 complicated deliveries (8.4% of all deliveries).

41 (6.9%) of newborns had complications. The major complications were prematurity (12), asphyxia neonatorum (12), low birth weight (5) and stillbirth (3) (Table 60).

Table 57.

DISTRIBUTION OF NEWBORNS BY BIRTH WEIGHT

WEIGHT (kg)	NO. OF NEWBORNS	(%)
Below 2.0	5	(1.2)
2.0 - 2.4	18	(4.3)
2.5 - 2.9	115	(27.2)
3.0 - 3.4	186	(44.0)
3.5 - 3.9	82	(19.4)
4.0 & above	17	(4.0)
TOTAL	*423	(100%)

* Data not available for 175 newborns

Table 58.

DISTRIBUTION OF NEWBORNS ACCORDING TO BIRTH WEIGHT AND GESTATIONAL AGE

GESTATION (weeks)	LOW BIRTH WEIGHT (< 2.5 kg)	NORMAL	TOTAL (%)
Preterm (<38 weeks)	13 (56.5)	92 (23.5)	105 (25.3)
Term	10 (43.5)	300 (76.5)	310 (74.7)
TOTAL	23 (100.0)	392 (100.0)	*415 (100.0)

* Data not available for 183 newborns

Table 59.

DISTRIBUTION OF MOTHERS
BY MATERNAL COMPLICATIONS AT BIRTH

COMPLICATIONS	NO. OF MOTHERS	(%)
LSCS	24	(48.0)
PROLONGED LABOUR	7	(14.0)
INSTRUMENTAL DELIVERY	7	(14.0)
BREECH DELIVERY	6	(12.0)
PERINEAL TEAR	2	(4.0)
PREMATURE LABOUR	1	(2.0)
RETAINED PLACENTA	1	(2.0)
PPH WITH RETAINED PLACENTA	1	(2.0)
RETAINED SECOND TWIN	1	(2.0)
TOTAL	50	(100.0%)

Table 60.

DISTRIBUTION OF NEWBORNS BY COMPLICATION AT DELIVERY

COMPLICATION	NO. OF NEWBORNS	(%)
PREMATURITY	17	(41.5)
ASPHYXIA NEANATORUM	12	(29.3)
LOW BIRTH WEIGHT	5	(12.2)
STILLBIRTH	3	(7.3)
CONGENITAL ABNORMALITY	3	(7.3)
FOETAL DISTRESS	1	(2.4)
TOTAL	41	(100.0%)

CHAPTER V (DISCUSSION)

The district of this study is within a rural area. Therefore it is expected that the majority of its population is made up of Malays and ethnic Malays in Malaysia are mostly Muslims. The high risk mothers selected in this study are almost homogenously Malays and Muslims. Being Malays and with Islam as religion would have some effect on their daily practices including the acceptance of modern health care. They would be expected to show some affinity towards traditional practices such as deliveries conducted by traditional birth attendants.

The level of formal education of the high risk mothers and their husbands in the study were found to be satisfactory. That augurs well in estimating their literacy level. One who has a few years of primary schooling is expected to be able to read and write and in this study the majority of the mothers and their husbands with primary education have completed six years of schooling; they dropped out just prior to joining secondary school. The estimated literacy level of the mothers and their husbands exceeded 85%. Literacy is an indicator for monitoring progress towards the "Health for All Programme" (WHO 1981). There was also no marked difference between the educational achievement of the sexes showing that the community has accepted the

importance of female education. This promises better health prospects for the future: the mothers would be receptive of increased communication and health education. The husbands' level of education is equally important as they could either catalyse or inhibit their wives in their utilisation of a health service. Husbands are also the main decision makers in the family .

The fact that the mothers and their husbands are mostly Malays living in a rural area would explain the trend of their economic activities which tend toward subsistence agriculture and self employment for men and becoming housewives for women. The study showed only about 5% of the mothers had other occupations. The other more than 95% were shown as housewives. This should be taken with the knowledge that in rural areas it is common for the housewives to go down to the land whenever there's a demand for extra labour. About 80% of the husbands were self employed and more than half of this were padi farmers. Subsistence agriculture and self employment suggests irregular income and this could contribute to, and be appreciated with the incidence of poverty in the State of Kelantan which is about 30% (Statistic Department, 1987). The self employed had the potential to grow food on their land or surpass the income of those in the employ of others if their economic ventures were to have succeeded. On the other

hand those employed by the government and private sector had steadier income and in general were more exposed to new developments. The family income influenced the utilisation of health care by the mothers in the form of travel expense and hospital pay, among others. An interesting observation is the 12% of husbands who were involved in trade. This could be related to the success of the New Economic Policy, a grand plan in action over the past 20 years, designed by the Malaysian government to eradicate poverty and restructure society so that ethnic groups are not identified along the lines of their economic activities, eg. Malays with agriculture.

Even though the mothers who stayed within 5 km from the nearest health clinic were more than 70% of total and seems satisfactory when compared with worse areas, the remainder 30% should not be considered to be a small proportion. Granted that the implementation of the Rural Health Service has tremendously improved coverage of rural population centres, but it is the minority in the fringes who could play a critical role in further improving the rural health status. Having had a personal experience of working in Pasir Puteh, the author knows that the outskirts of the district were linked by poor roads with no public transportation. Some pregnant mothers had to walk more than 5 km or had to uncomfortably resort to riding pillion on bicycles or motorcycles. The situation became worse when such

mothers had to deliver at night or when there were floods which occur annually.

Almost 60% of the mothers fell within the age range 30 tO 39 years. However, like in many other distributions, those at the extremes are more important. 7.2% of the mothers were under 20 years old and 8.7% were more than 40 years making a total of 15.9% the mothers who were at risk due to extremes of reproductive age. The 5-year class interval of table 22 made it possible to note the presence of 2 child mothers and 4 mothers in the class 45 - 50 years. This reflects the tendency of the mothers to give birth throughout their reproductive life. This could be explained by the traditional and cultural preference of rural folks for early marriage and large families. Their religion also could be an explanatory factor where the official ruling prohibits family planning except for specific reasons considered on case-to-case basis (National Council for Islamic Affairs, Malaysia, 1982).

Only 0.8% of the mothers were below 140 cm. It seems that short stature is not a major problem among the mothers of study. If we were to associate this with the many cases of prolonged labour considered under Previous Obstetric History we would expect a few more short statured mothers. The question is whether the cut-off point of 140 cm is too low for a progressing country like Malaysia, or even a rural area like Pasir Puteh? We

could have caught more "relative short statures" and be more prepared for a few more prolonged labours if, say, 150 cm was used as the decisive height as has been used in many studies.

Normal weight gain (as defined on page 19) in pregnancy is 0.5 kg/week for 20 to 40 weeks of gestation. In this study the majority of mothers first attended antenatal clinic at 16 to 27 weeks of gestation. Thus it can be approximated that the weight gain were studied for the last 20 weeks of their pregnancy. Therefore the average weight gain of 0.1 to 0.4 kg/week attained by 80% of the mothers was unsatisfactory suggesting inadequate nutrition. This however is not supported by other evidence. There was no record of malnutrition clinically. The birth weights and Hb levels were mostly satisfactory. Its validity is further questioned by the absence of data for 213 out of 598 mothers making way for selection bias. But, even if all the data were available about 40% of the mothers would still have the same range of average weight gain, saying that the finding is not necessarily unacceptable. Finally, another better designed study to verify this is in order.

Tables 25 and 27 were purposely laid out without any class interval to show the range of gravidity and parity and to impress the distribution of mothers all

along it. Perhaps, only perhaps, the study area is one of the last places on earth to show the extremes of gravidity and parity of 16 or 15. About 60% of the mothers were within the range of gravida and para 5 to 10. Only about 15% of mothers were in the "low risk" range of gravida 2 - 5 and para 2 - 4. The "high risk" groups of about 85% were made up of higher and lower gravidas and paras. This proportion is quite so overwhelming that this whole study of high risk mothers could have been replaced by a study on gravidity and parity and their close associates and perchance could have produced similarly interesting results. The high gravidity and parity predisposed to high fertility and this is a feature of rural as opposed to urban areas (Hamid Arshat, Tey, N. P. 1988). It would also be seen that grandmultiparity would have caused a disproportionately small number of adverse outcomes even if all the total adverse outcomes in this study were assigned to it. Despite many studies suggesting in the affirmative doubts still arose as to whether multiparity is a true risk factor in pregnancy. It was strongly suggested that grandmultiparity in and of itself in a healthy, economically stable population afforded modern medical care is not a major risk factor and that previous reports primarily reflected social class factors and not parity per se (Eidelmen AI, Kamar

R, Schimmel MS, Bar-On E,(1988)). This author's response is that Malaysia with its population unlike that qualified above should wait and see whilst conducting local studies.

17.4% of the mothers had a history of abortions and 7.3% had a history of stillbirths. These are much higher than the abortion and stillbirth rates respectively of 4.9% and 7.3% for the general population of rural areas (Sinnathuray, et al; 1977). In the previous obstetric history of mothers about 35% had some form of relevant history. Stillbirths and abortions made up the majority of more than 15%. Single abortions because of its sheer number should be given more or equal importance as habitual or other multiple abortions and should not have been put under the category "others".

Table 33 showed the various considered risk factors in this study arranged in the order of decreasing frequency of occurence. As shown by various studies primiparity is a definite risk factor by itself. However the definitions as given by the Maternal and Child Health Unit (page 19) seem to exclude primiparity as a risk factor category except for those primiparas under 19 years old and 35 years and over. This, is felt to be without strong basis and should be rectified.The author has decided to separate age and primiparity as deservingly separate risk factors i.e. an 18-year old

primipara has two risk factors: primiparity and young age. The above definitions also included previous LSCS (lower segment caesarean section) as part of bad obstetric history. The author has taken previous LSCS out as a separate risk factor because previous LSCS need not really be a bad obstetric history. Instead the LSCS could be the best obstetrics within the then circumstances and could even become good history. Bad or good history, previous LSCS is a definite risk factor and should be put out separately, as was done. Risk factors of low frequency of occurence did not mean unimportance just as the most frequently occuring did not necessarily mean the most important (as discussed earlier). Age is a natural determinant of a mother having certain age-related risk factors. Education level does not seem to influence the distribution of risk factors in mothers.

Only 55 mothers were anaemic at first antenatal visit. Total anaemic mothers throughout the pregnancies were 61. This could mean the initial anaemic mothers never improved with the development of anaemia among new mothers or some or all of the initial anaemias improved but were replaced by a greater number of new anaemic mothers as the pregnancy progressed. This goes to show the importance of the prevalence of anaemia among pregnant mothers despite aggressive measures being

taken. In Pasir Puteh haematinics were given as a routine and investigations, treatment, food supplements and referral were appropriately carried out depending on severity, cause and stage of pregnancy.

The majority of mothers attended their first antenatal visit at the fairly acceptable gestational age of 16 to 27 weeks. However a large proportion of 11.5% had a first visit at or after 28 weeks of gestation. This is very late and precludes the correct estimation of foetal growth and could have prevented the early detection of some important findings. The challenge is to encourage as early first visit as possible. Age and education level did not seem to affect preference for early or late visit. The number of total visits are also related to time of first visit to antenatal clinic. 66% had less than the suggested minimum of 8 visits. Education level did not seem to be a determining factor as did not age. A strong factor for determining total visits is the type of risk factor the mother had, as shown by the distribution of total number of examinations by doctor.

Hospital referrals were mainly for antenatal complications which were mainly the high risk factors of pregnancy, understandably so with the study population of high risk mothers. The number of nonreferrals (71.3%) suggested that they were within the capability of the

local health service to be safely managed. This also brings forward the need to refine the weightage tied to each risk factor to further identify those with real critical importance. This as yet has not been done locally. The choice of hospitals for referral were probably mainly determined by the complications of pregnancy and the type of services required more than the type of hospital or its distance.

The majority of the high risk mothers still delivered at home. This is a far cry from the idealistic target that all high risk mothers deliver in hospital, if not for all mothers as has practically been achieved in Singapore. One contributing reason is the absence of a district hospital in Pasir Puteh itself. It was seen (INTRODUCTION - Table 13) that the two districts in the State of Kelantan without a district hospital (Pasir Puteh and Bachok) had the lowest rates of hospital deliveries compared to the rest of the districts. The mothers, being rural, also could not help being influenced by tradition and elders (Noor Hisham, 1987).

Ironically, but not surprisingly, the complications of pregnancy occured more with hospital deliveries, with deliveries attended by doctors as compared to deliveries at home and even unattended deliveries. This could be explained by the degrees of complications afflicting the mothers in the first place. In one sense it explains

that the right mothers were sent to the hospitals.

Most deliveries of the high risk mothers, including those that were at home, were attended by trained personnel. However 40 out of 584 cases were still delivered by traditional birth attendants (TBA) and delivered before arrival of attendants (BBA). This is potentially dangerous especially for high risk mothers. It is also strongly believed that the BBA deliveries were actually conducted by TBAs'. This belief arose from the finding in many investigations of BBA deliveries that when a government midwife arrived at a mother's house, almost invariably a TBA was already there, and claiming to have arrived after the baby was already born. There seems to be no effect by distance from clinic and no effect by level of education on the choice of birth attendants. There were more from within 5 km of a health clinic because of the geographical distribution of population discussed earlier.

There seems to be too many preterms (25%) which was not supported by low birth weight (6.5%). This could be explained by underestimation of gestational age at first visit which was used in calculation without considering subsequent adjustments. This could show some lack of skill in determining gestational age at first antenatal visit. The birth weights were within expectation.

The maternal and newborn complications were

generally higher than in general population as expected. The weakness here is that the complications could not be associated to individual risk factors. It is suggested that a retrospective study be done to achieve that.

It was noted above that age, education and distance did not play an important role in the choice of the mothers. I put forward that the most important influence in their decision making is the type of risk factor they had and whether they had been convinced about the potential of that risk, besides the influence of their rural and traditional backgrounds.

This study has attempted to describe the high risk mothers as per its objectives. It has some weaknesses in design which emphasises yet again the importance of proper planning of a study. It has the potential of being analytical but that is best left to a proper analytical study.

The sample size is large enough to be representative of its study population. But is it externally valid? In view of the clear-cut background characteristics, it may be possible for the findings to be generalised to other rural populations of high risk pregnant mothers in Malaysia who are mainly Malays and Muslims, who are similar with regard to socio-economic and cultural values.

CHAPTER VI (RECOMMENDATIONS)

The following recommendations are based on the information and findings obtained from the study.

1. IMPROVEMENT OF INFRASTRUCTURE

1.1 Pasir Puteh needs a district hospital to be built to facilitate better acceptance of hospital deliveries. It is currently being served by hospitals in neighbouring districts and the rate of hospital delivery is poor.

1.2 Outlying roads need to be improved to allow larger vehicles like an ambulance or a bus to approach the remoter areas to improve transportation.

1.3 Communication should be improved by providing a public phone in every small population centre of about 50 houses. This is to reduce time loss in cases of emergency.

2. ENCOURAGING THE ESTABLISHMENT OF "TRAINED PRIVATE MIDWIVES" TO TAKE OVER FROM TRADITIONAL BIRTH ATTENDANTS

Traditional birth attendants are aging women who would become extinct soon if they are gradually displaced.

The way to do this is by encouraging government midwives to retire early e.g. at 45 years old to go into

private practice. Their relationship with government health services should be maintained. Yet they do not wear uniforms and do not follow specific time-tables. They merge into the community and grow in stature like the traditional birth attendant as a respected elderly village woman. Her practice is modern and there should be some form of a regular refresher course in midwifery.

3. A SCORING SYSTEM FOR HIGH RISK FACTORS OF PREGNANCY

Studies should be designed to assign "weights" to risk factors according to findings obtained locally. One way of doing it is by retrospective studies starting with adverse outcomes of pregnancy and relating backwards to risk factors.

If such a scoring system is established, the identification of high risk mothers would be more efficient and the provision of care more effective.

CHAPTER VII (SUMMARY)

1. This study titled 'A Survey of High Risk Pregnant Mothers in the District of Pasir Puteh, Kelantan' was conducted in the afore-mentioned district in the last two weeks of the year 1988. It is a descriptive survey.

2. The study population consisted of 1612 high risk pregnant mothers who delivered on and between 01/12/1987 and 30/11/1988. 598 sample units were finally systematically selected for data collection. The data collected are secondary with the mothers' 'Antenatal Cards' as documentary sources.

3. The high risk mothers were almost homogenously Malays and Muslims. Only 14.5% had no formal education. Their husbands are similarly educated. 95.5% of the mothers were housewives. 79.6% of husbands were self-employed, mainly as padi farmers. 71.6% of the mothers lived less than 5 km away from the nearest health clinic.

4. 74.5% of the mothers were between 30 - 39 years old. Only 0.8% of the mothers were less than 140 cm in height. 80.0% of the mothers gained an average of 0.0 - 0.4 kg/week of gestation (cf. normal of 0.5 kg/week). 64.8% were gravida 6 or more. 12.2% were gravida 1. 17.4% of mothers have had abortions in the past while

7.3% have had stillbirths. 57.2% had 1 risk factor, 34.6% had 2 risk factors, 5.4% 3 risk factors and 2.8% 4 or more risk factors. 44.6% of risk factors were grandmultiparity, 11.3% were spacing between deliveries less than 2 years, 10.3% were BOH, 7.8% were primiparity and 6.7% were anaemia.

5. 83.4% of the mothers had gestational age at first antenatal visit of 16 - 27 weeks. 66.0% of mothers had less than 8 total antenatal visits while 34.0% had more than 8 visits. 98.5% had VDRL blood tests done. 1.2% had positive results. 92.0% of mothers received ATT injections. 77.3% had 1 or 2 antenatal examinations by a doctor. The rest were examined for 3 to 8 times. 28.8% of mothers were referred to hospitals. Reasons for referral were mainly antenatal complications. 63.8% of mothers delivered at home while 36.2% delivered in hospitals. 2.7% of home deliveries ended in complications, 2.1% for District Hospital and 11.3% at University Hospital. 4.3% of deliveries were BBAs, 2.6% conducted by TBAs, 60.8% by trained midwives, 23.1% by doctors and 9.2% by unidentified hospital staff. Complications by birth attendants were BBA 0%, TBA 7.1%, Doctor 8.9%, unidentified hospital staff 9.3% and trained midwives 2.1%.

6. 74.8% of newborns were mature and 25% premature by

gestational age at birth. 5.5% of newborns were under 2.5 kg, median weight was 3.15 kg. Major maternal complications (8.4% of all deliveries) were caesarean sections (24), prolonged labour (7), breech delivery (6) and instrumental deliveries (7). 6.9% of newborns had complications, the major ones being prematurity (12), asphyxia (12), low birth weights (5) and stillbirth (3).

REFERENCES

1. Alexander, G.R., Cornely, D.A., (1987) : Am J Prev Med ; 3(5) : p. 243-253.

2. Andersch, B., Svensson, A., Hansson, L., (1984) : Characteristics of Hypertension In Pregnancy. A Retrospective Study of 261 consecutive cases ; Acta Obstet Gynecol Scand ; 118 : p. 33-38.

3. Avery RH, Penington BC, (1973) : Identification and Evaluation of High Risk Pregnancy : The Perinatal Concept; Clin Obstet Gynecol; 16 : p. 3-27.

4. Boyce, W.T., Schaefer, C., Harrison, H.R., Haffnmer W.H., Lewis, M., Wright, A.L. (1986) : Social and Cultural Factors in Pregnancy Complications Among Navajo Women, Am J Epidemiol ; 124(2) : p. 242-253.

5. Chenoweth, J.N., Esler, E.J., Chang, A., Keeping, J.D., Morrison, J., (1983) : Understanding Preterm Labour : The Use of Path analysis ; Aust NZ J Obstet Gynecol ; 23(4) : p. 199-203.

6. Clark, S.L., Koonings, P.P., Phelan, J.P., (1985) : Placenta Praevia/Accreta And Prior Caesarean Section ; Obstet Gynecol ; 66(1) : p. 89-92.

7. Dougherty C.R., Jones, A.D. (1988) : Obstetric Management and Outcome Related to Maternal Characteristics, Am J Obstet Gynecol ; 158(3pt1) : p. 470-474.

8. Eidelman, Kamar, R., Schimmel, M.S., Bar-on, E (1988): The Grandmultipara: Is she still a risk? Am. J. Obster Gynecol; 158(2): 389-92.

9. Finbloom, R.I., Forman, B.Y., (1985) : Pregnancy, Birth And The Early Months ; Addison-Wesley Publishing Co., Iowa.

10. Gold, E.M., (1973) : The High Risk Pregnancy IN Wallace, H.M., Gold, E.M., Lis. E.F., (ed.) : Maternal and Child Health Practices ; Charles C Thomas Publisher, USA, p. 245, 247.

11. Hamid Arshat, Tey, N.P. (1988): An overview of The Population Dynamics in Malaysia; Malaysia J. Reprod Health; 6(1): 23-46.

12. Jacobson, H.N., (1973) : Nutrition And Pregnancy IN Wallace, H.M., Gold, E.M., Lis, E.F., (ed.) : Maternal and Child Health Practices ; Charles C Thomas Publisher, USA, p. 313.

13. Janowitz, B., Wallace, S., Araujo, G., Araujo, L., (1985) : Referrals by TBA's in Northeast Brazil,

Am J Public Health; 75(7) : 745-748.

14. Karim R, (1982) : Overview of Maternal Mortality in Malaysia and the Application of the Risk Approach Strategy in Maternal Health; Paper presented for National Seminar of Maternal Health.

15. Kek, L.P., Ng, C.S., Chng, K.P., Ratnam, S.S., Cheah, J.S., Yeo, P.B., Gwee, H.M., Thai, A.C., Tan, K.L., Joseph, R., (1985) : Extremes of Foetal Birth Weight For Gestation in Infants of Diabetic Mothers ; Ann Acad Med S'pore ; 14(2) : p. 303-306.

16. Khwaja, S.S., Al-Sibai, M.H., Al-Suleiman, S.A., El-Zibdeh, M.Y., (1986) : Obstetric Implications of Pregnancy in Adolescence : Acta Obstet Gynecol Scand ; 65(1) : p. 57-61.

17. Kiely, J.L., Paneth, N., Susser, M., (1986) : An Assessment of the Effect of Maternal Age and Parity in Different Components of Perinatal Mortality ; Am J Obstet Gynecol ; 154(1) : p. 146-148.

18. Long, P.A., Oats, J.N., (1987) : Pre-eclampsia In Twin Pregnancy - Severity And Pathogenesis ; Aust NZ J Obstet Gynecol ; 27(1) : p. 1-5.

19. Lwellyn, J.D., (1965) : Severe Anaemia in Pregnancy (as seen in Kuala Lumpur, Malaysia) ; Aust NZ J Obstet Gynecol ; 5 : p. 191-197.

20. Malaysia (1987) Statistics Department Malaysia: Household Income Statistics.

21. Malaysia (1982) National Council for Islamic Affairs: Official Ruling on Family Planning.

22. Malaysia (1984) Annual Report 1983/84 Ministry of Health Malaysia.

23. Malaysia (1987) Annual Report 1987 Family Health Unit, Kelantan.

24. Malaysia (1987) Guidelines for the Management of High Risk Pregnant Mothers, Maternal and Child Health Unit, Ministry of Health, Malaysia .

25. Malaysia (1987) Nutrition Unit, Health Department, Kelantan.

26. Malaysia (1987) Statistics Department Malaysia.

27. Malaysia (1988) Report of Pasir Puteh District Office 1988.

28. Mwambingu, F.T., Al Meshari, A.A., Akiel, A., (1988) : The Problem of Grandmultiparity in Current Obstetric Practice : Int J Gynecol Obstet; 26(3) : p. 355-359.

29. Noor Hisham bin Ramly: A Comparative Study of Factors Affecting the Choice of Place of Delivery Among High Risk Malay Mothers in Sungai Acheh, Seberang Perak Selatan, Pulau Pinang 1985-1986 (MPH Dissertation).

30. Ounsted, M., Moar, V.A., Cockburn, J., Redman, C.W., (1984) : Factors Associated With The Intellectual Ability of Children Born to Women With High Risk Pregnancies ; Br Med J ; 288(6423) : p. 1038-1041.

31. Risch, H.A., Weiss, N.S., Clarke, E.A., Miller, A.B., (1988) : Risk Factors For Spontaneous Abortion And Its Recurrence ; Am J Epidemiol ; 128(2) : p. 420-430.

32. Seidman, D.S., Gale, R., Slater, P.E., Ever-Hadani, P., Harlap, S., (1987) : Does Grandmultiparity Affect Foetal Outcome ? ; Int J Gynecol Obstet ; 25(1) : p. 1-7.

33. Sillins, J., Semenciw, R.N., Morrison, HI, Lindsay, J., Sherman, G.J., Mao, U., Wigle, D.T., (1985) : Risk Factors for Perinatal Mortality in Canada ; Can Med Assoc J, 133(12) : p. 1214-1219.

34. Sinnathuray, T.A., Yusof, K., Thomas, N.K.F.,Palan, V.T., Tan, B.A., (1977): Report on Maternal Health and

Early Pregnancy Wastage in Peninsular Malaysia, FPPA Malaysia: p. 38.

35. Tanbo, T.G., Bungum, L., (1987) : The Grandmultipara - Maternal and Neonatal Complications ; Acta Obstet Gynecol Scand ; 66(1) : p. 53-36.

36. Thompson, J.D., Freeman, M.G., Kitay, D.G., (1973) : Obstetric Antecedents To Perinatal Mortality And Morbidity IN Wallace, H.M., Gold, E.M., Lis, E.F., (ed.) : Maternal and Child Health Practices ; Charles C Thomas Publisher, USA, p. 271-273.

37. Wallace, H.M., (1981) : Factors Associated With Perinatal Mortality and Morbidity IN Wallace, H.M., Gold, E.M., Lis, E.F., (ed) : Maternal and Child Health Practices, Charles C Thomas Publisher, USA, p. 518-520.

38. Wallace, H.M., (1973) : Factors Associated With Perinatal Morbidity and Mortality IN Wallace, H.M., Gold, E.M., Lis, E.F., : Maternal and Child Health Practices ; Charles C Thomas Publisher, USA, p. 521.

39. Wallace, H.M. and Ebrahim, G.J. (1981) Maternal and Child Health Around the World, The Macmillan Press Ltd, London, preface.

40. Wallace, H.M., Medina, A.S., Minkler, D.H. (1981)

Worldwide Problems in the Field of Maternal and Child Health and Family Planning Services in the Developing countries IN Wallace, H.M., Ebrahim, G.J. (ed.) Maternal and Child Health Around the World. The Macmillan Press Ltd. London p. 33.

41. WHO (1981) Development of Indicators towards Health for All. Geneva.

42. WHO The Prevention of Perinatal Mortality And Morbidity ; Technical Report Series, No. 457, Geneva.

43. WHO (1969) World Health Statistics Report, Vol. 22, No. 6.

44. WHO (1975) World Health Statistics Annual, Vol. 1 Vital Statistics and Causes of Death. Geneva.

45. WHO (1978) Risk Approach for Maternal and Child Health Care, Geneva.

46. WHO (1977) World Population Estimates, The Environmental Fund, Washington, D.C.

APPENDIX A

SURVEY OF HIGH RISK MOTHERS IN THE DISTRICT OF

PASIR PUTEH FOR THE PERIOD OF 01/12/87 TO 30/11/88.

1.NAMA_____NO.PENDAFTARAN_____

2.BANGSA (KUMPULAN ETNIK):( )MELAYU ( )INDIA
( )CINA ( )LAIN-LAIN_____

3.AGAMA:( )ISLAM ( )HINDU
( )BUDHA ( )KRISTIAN ( )LAIN-LAIN _____

4.TARIKH LAHIR:_____/_____/_____
( )TIDAK DIKETAHUI

5.TARIKH LAWATAN ANTENATAL PERTAMA _____/_____/_____

6.UMUR PADA LAWATAN ANTENATAL PERTAMA:
_____TAHUN_____BULAN

7.TARIKH LAWATAN ANTENATAL AKHIR _____/_____/_____

8.TEMPOH ANTARA LAWATAN ANTENATAL PERTAMA DAN AKHIR:
_____MINGGU

9.TARAF PELAJARAN:

SEKOLAH RENDAH		SEKOLAH MENENGAH		PENGAJIAN TINGGI	
DARJAH 1	( )	TINNGKATAN 1	( )	DIPLOMA	( )
2	( )	2	( )	IJAZAH	( )
3	( )	3	( )	TIDAK TAMAT	( )
4	( )	4	( )		
5	( )	5	( )		
6	( )	6R	( )		
		6A	( )		

10.PEKERJAAN:( )SURIRUMAH
( )_____(NYATAKAN)
( )TIDAK DIKETAHUI

11.TARAF PELAJARAN SUAMI:

SEKOLAH RENDAH		SEKOLAH MENENGAH		PENGAJIAN TINGGI	
DARJAH 1	( )	TINGKATAN 1	( )	DIPLOMA	( )
2	( )	2	( )	IJAZAH	( )
3	( )	3	( )	TIDAK TAMAT	( )
4	( )	4	( )		
5	( )	5	( )		
6	( )	6R	( )		
		6A	( )		

12.PEKERJAAN SUAMI:( )BERKERJA SENDIRI_____(NYATAKAN)
( )PEKERJA KERAJAAN_____(NYATAKAN)
( )PEKERJA SWASTA _____(NYATAKAN)
( )TIADA KERJA

13.JAUH RUMAH DARI RUMAH BIDAN KERAJAAN/KLINIK DESA__KM.

14.TINGGI _____ CM.

15.BERAT PADA LAWATAN ANTENATAL PERTAMA _____ KG.
16.BERAT PADA LAWATAN ANTENATAL TERAKHIR _____ KG.

17.JUMLAH PERTAMBAHAN BERAT ANTARA LAWATAN ANTENATAL
PERTAMA DAN AKHIR _____KG

18.HITUNGPANJANG PERTAMBAHAN BERAT BADAN SEMINGGU____KG.

19.GRAVIDA/PARA: G____P____A____SB____

20.SEJARAH OBSTETRIK TERDAHULU (KOMPLIKASI):
( )APH ( )PPH
( )KEGUGURAN BERTURUT LEBIH DRPD DUA KALI
( )ANAK MATI DALAM KANDUNGAN
( )PEMBEDAHAN CAESAREAN
( )SAKIT BERSALIN LAMA (PROLONGED LABOUR)
( )LAIN-LAIN _____ (NYATAKAN)

21.FAKTOR-FAKTOR RISIKO TINGGI PADA KANDUNGAN TERAKHIR :

UMUR IBU ( )KURANG DRPD 19 TAHUN
( )MELEBIHI 35 TAHUN (UNTUK PRIMIP)
( )MELEBIHI 40 TAHUN (UNTUK MULTIP)

( )GRAVIDA IBU 6 DAN KE ATAS
JARAK KELAHIRAN ( )KURANG DRPD 2 TAHUN
( )LEBIH DRPD 5 TAHUN

PENYAKIT IBU: ( )SAKIT JANTUNG
( )DARAH TINGGI (TEKANAN DARAH LEBIH DRPD 140/90 mmHg PADA DUA KALI BACAAN BERTURUT-TURUT)
( )KENCING MANIS
( )SAKIT BUAH PINGGANG
( )LAIN-LAIN (NYATAKAN)_____

( )UKURAN TINGGI KURANG DRPD 140 CM.
( )KANDUNGAN KEMBAR
( )KEDUDUKAN TIDAK BETUL (MALPRESENTATION)

( )ANEMIA (Hb KURANG DRPD 9 GM %)
( )PRE-ECLAMPSIA ( )ECLAMPSIA

PERDARAHAN SEMASA MENGANDUNG ( )KEGUGURAN
( )APH
( )PRIMIP
( )BAD OBSTETRIC HISTORY
( )PREVIOUS LSCS

22.TEKANAN DARAH (BP) PADA LAWATAN ANTENATAL PERTAMA
_____/___ MMHG

23.KANDUNGAN Hb (gm%) PADA LAWATAN ANTENATAL PERTAMA
_____

24.VDRL ( )POSITIF
TPHA ( )POSITIF
( )DIRAWAT
( )RAWATAN TIDAK SEMPURNA
( )TIDAK DIRAWAT
TPHA ( )NEGATIF
VDRL ( )NEGATIF

25.ATT: PRIMIP ( )DOS PERTAMA ( )DOS KEDUA
MULTIP ( )DOS TAMBAHAN

26.JUMLAH LAWATAN ANTENATAL _____ KALI
27.UMUR GESTASI PADA LAWATAN ANTENATAL PERTAMA
_____/52

28.PEMERIKSAAN ANTENATAL OLEH DOKTOR:
JUMLAH PEMERIKSAAN _____ KALI
UMUR GESTASI PADA PEMERIKSAAN PERTAMA _____/52
UMUR GESTASI PADA PEMERIKSAAN TERAKHIR_____/52

29.RUJUKAN KE HOSPITAL:

SEBAB RUJUKAN ( )PENDAPAT KEDUA (SECOND OPINION)
( )PENYIASATAN LANJUT ( )RAWATAN PAKAR
( )KOMPLIKASI ANTENATAL
(NYATAKAN)_____
( )LAIN-LAIN (NYATAKAN)_____

30.HOSPITAL RUJUKAN: ( )HD BESUT ( )HD MACHANG
( )HOSP. USM

31.TEMPAT LAHIR:( )RUMAH ( )HDB ( )HDM ( )HUSM
( )_____
32.ATENDAN MASA LAHIR: ( )BBA ( )BIDAN KG. ( )BIDAN
TERLATIH
( )DOKTOR ( )LAIN _____

33.TARIKH LAHIR ANAK _____/_____/_____
34.LAMA KELAHIRAN SELEPAS LAWATAN ANTENATAL
PERTAMA_____/52
35.UMUR GESTASI ANAK SEMASA LAHIR LEBIHKURANG_____/52
36.BERAT LAHIR ANAK _____KG

37.KOMPLIKASI KELAHIRAN (NYATAKAN) _____
38.ANAK YANG DILAHIRKAN:( )NORMAL
( )KOMPLIKASI (NYATAKAN) _____

APPENDIX B

GUIDELINES ON SELECTED VARIABLES
(* Please refer to APPENDIX A where relevant)

NO.* VARIABLE	CLARIFICATION
6. Age at first antenatal visit	- calculated by obtaining the interval between the dates of 4.* and 5.* in years and the nearest complete month - if 4.* is left blank, 6.* is taken unchanged as per document - when inputting age is converted to years to the nearest one decimal place
8. Duration between first and last antenatal visits	- calculated by obtaining the interval between the dates of 5.* and 7.* in in weeks and rounding to the nearest one decimal place. A month is taken as 30 days
10. Mother's occupation	- types of specific occupations are hand-tallied
12. Husband's occupation	- (similarly treated as 10.*)
13. Distance of residence to nearest health clinic	- in km., rounded to the nearest one decimal place
14. Height of mothers	- in cm., rounded to the nearest one centimetre
15. and 16. Weights of mother	- in kg., rounded to the nearest one decimal point
17. Weight gain	- weight in 16.* minus 15.*
18. Average weight gain per week	- weight of 17.* divided by duration of 8.*
22. Blood pressure at first antenatal visit	- classified for analysis as follows: 1 < 80/60,2=80/60-99/69,3=100/70-119/79 4=120/80-139/89,5=> 140/90(all in mmHg) - when systolic and dystolic pressures are too divergent classify by dystolic

(continued)

NO.* VARIABLE	CLARIFICATION
23. Hb level at first antenatal visit	- in g% rounded to the nearest one decimal place (already mostly expressed as such) - (the Hb determination was either by one of two methods: photometer [at Main Health Centres] and Sahli's [at the other clinics])
29. Reasons for hospital referral	- specific reasons for referral to be manually tallied
34. Period between first antenatal visit and date of birth	- obtained by calculating time between dates of 5.* and 33.* in weeks rounded to the nearest one decimal place - a month is taken as 30 days
35. Gestational age at birth	- obtained by adding geststional age of 27.* to the period of 34.* - in weeks rounded to the nearest week
36. Birth weight	- in kg., rounded to the nearest second decimal place
37. Maternal complications at birth	- types of complications to be manually tallied
38. Newborn complications	- types of complications to be manually tallied
*. All the other variables	- data to be inputted either as they were or as codes where appropriate